VOLUME LIII NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

MARCH, 1928

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By N. C. WYETH

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded forty years ago the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

TO further the important study of solar radiation in relation to long-range weather forecastings, The Society has appropriated $60,000 to enable the Smithsonian Institution to establish a station for four years on Mt. Brukkaros, in Southwest Africa.

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Urged ever onw
the Earth, has
behold the Goa

nward by the Quest of the Unknown, the Dauntless Leader, symbolic of Man's age-old struggle to Master
as Braved the Sea, Conquered the Desert, Pierced the Jungle, Scaled the Mount. At last his tired eyes
al of his Dream. It is his gift to World Knowledge.

The Discoverer

This is the central canvas in a notable series of five great murals—The Romance of Discovery, by the internation famous artist, N. C. Wyeth—recently completed for the National Geographic Society headquarters in Washington. four remaining paintings will be reproduced as frontispieces with the National Geographic Magazine during 1928.

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n Washington. The
ine during 1928.

How to tell if you want a new watch

Maybe you want a new watch and don't know that you do. Here is a way to tell.

Does the sight of a beautiful new watch in a jeweler's window attract you—stop you—fascinate you?

Do you instinctively pause to look at it?

Do you glance to see if the price is displayed before you move on?

If so, you have a deep, unconscious *want* for a new watch; and should do something about it right away.

So next time, go a step farther than window-shopping. Go inside.

Your jeweler can show you the Hamilton Watch in many models—strap or pocket, for men or women, in cases of filled gold, solid gold and platinum—at prices that range from $48 to $685.

Two booklets, "The Timekeeper" and "The Care of Your Watch," will be mailed on request. Address Hamilton Watch Company, 882 Columbia Avenue, Lancaster, Pennsylvania.

Top . . . . Man's Strap Model, The "Square." *A shape in increasing vogue—especially among men who appreciate that rare combination of accuracy and smart appearance in their strap watches. In filled gold or 14k engraved, $57 and $87. Also at $55 and $85 in plain cases.*

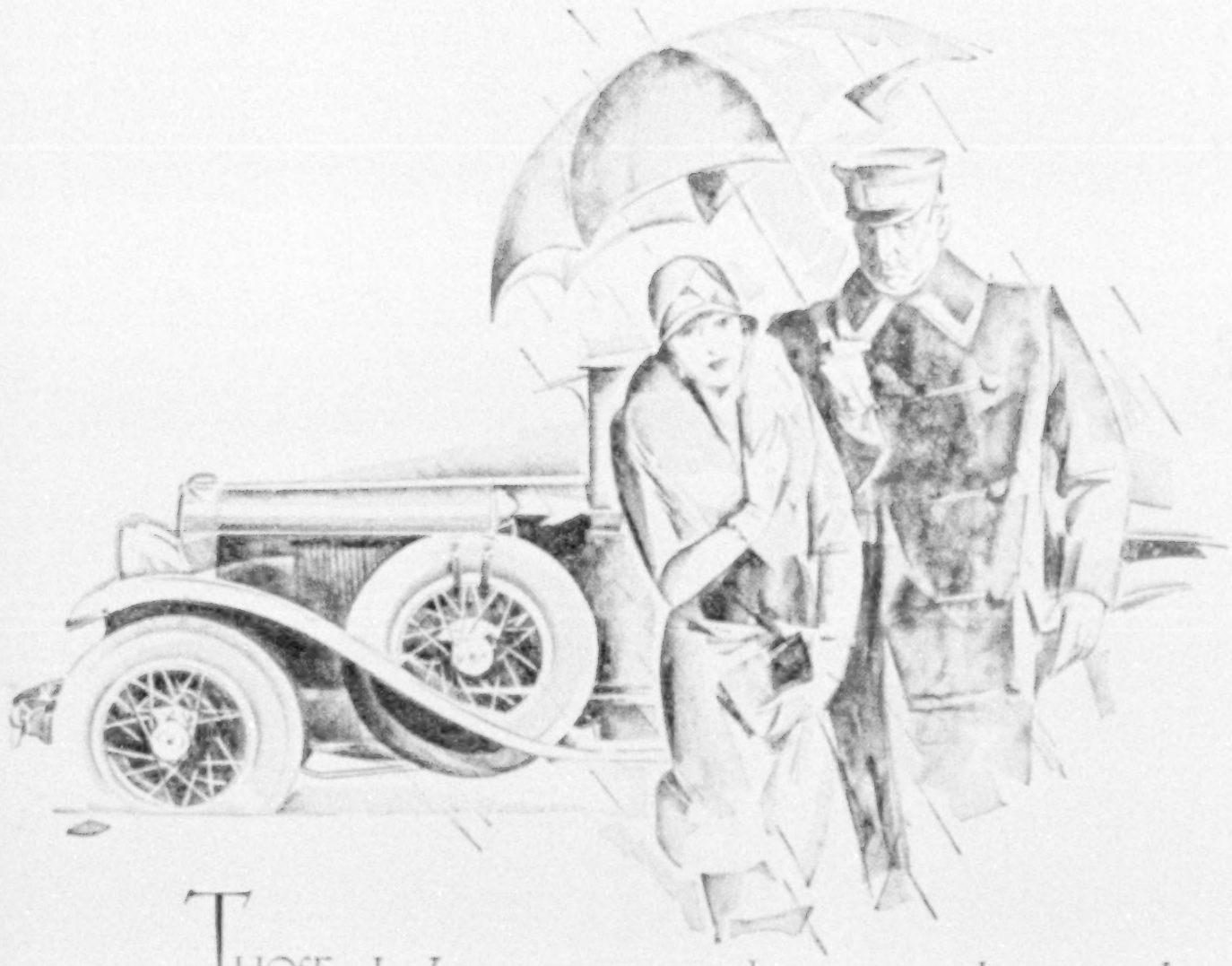
Center . . . . Man's Strap Model, The "Oval." *Quite smart, quite new, is the new Hamilton "Oval" strap model in either filled or 14k green or white gold. Fitted with the exceptionally accurate Hamilton strap watch movement. Plain at $55 and $85; engraved at $57 and $87*

Below . . . . The Brunswick. *Designed with an eye to tomorrow—but not at all ornate. 14k green or white gold engraved, with dial shown, $112 to $172. Other Hamiltons at $48 upwards.*

Hamilton *The Watch of Railroad Accuracy*

LA SALLE

COMPANION CAR TO CADILLAC



THOSE who *know* motor-cars and motor-car values, quite obviously, find nothing else to compensate for the performance supremacy of LaSalle's proved V-type, 90-degree, 8-cylinder, Cadillac-built engine — nowhere the radiant beauty of color, spirited lines, studied appointments of LaSalle. With this year's prices substantially lower and the addition of five new models you need no longer forego the gratification and prestige of owning a LaSalle — companion car to Cadillac.

If you prefer to buy out of income, as nearly everyone does today, the General Motors plan is very liberal. The appraisal value of your car is, of course, acceptable as cash.

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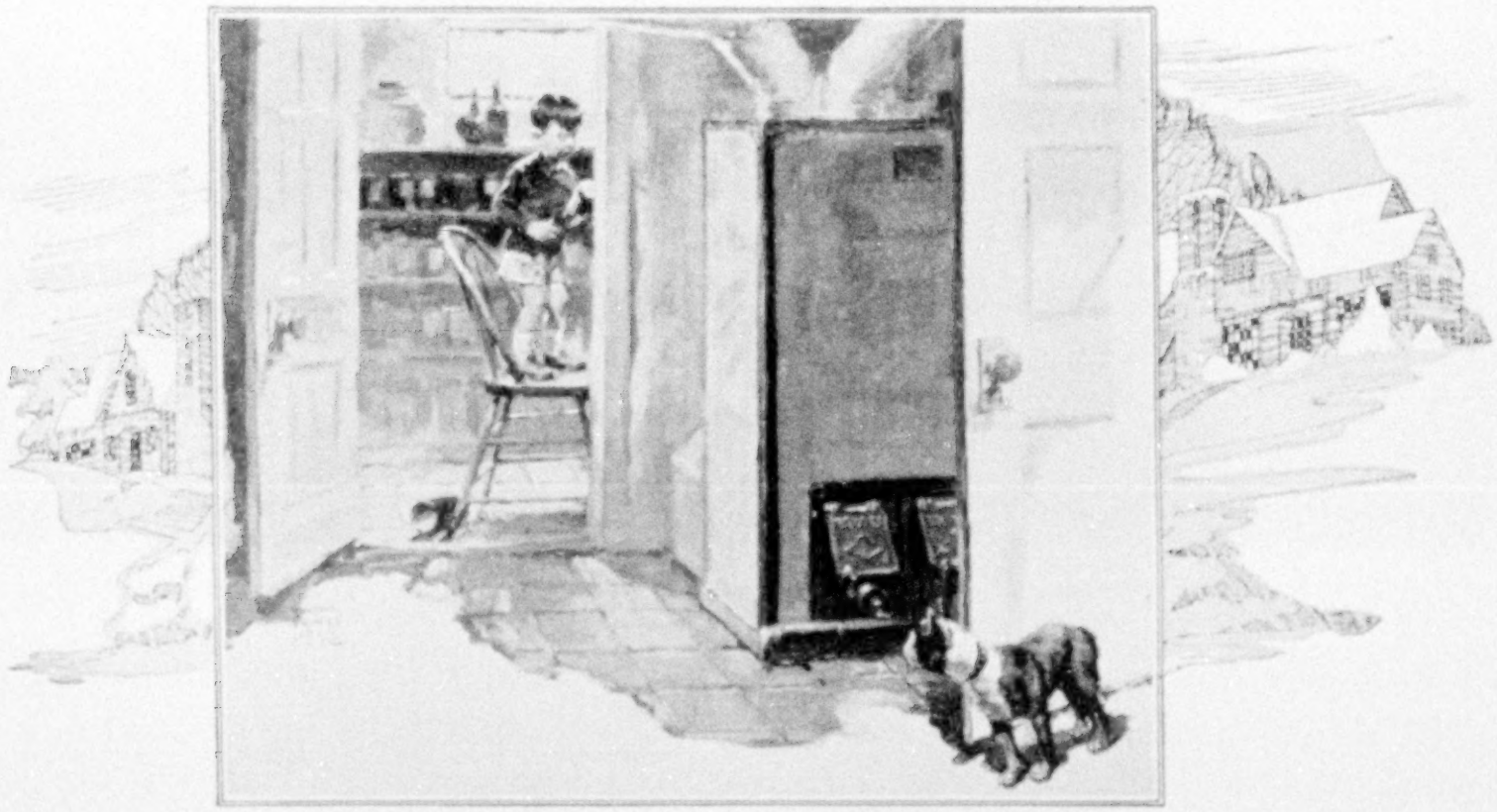
Division of General Motors Corporation

Detroit, Michigan — Oshawa, Canada



Let your Pup be the Furnace Man

and "Save the Basement Stairs"

THOSE everlasting trips to the basement to tend the furnace are needless. Bryant Automatic Gas Heating is utterly carefree; your pup can be the furnace man! The entire heating system needs no more care and attention than a good, 8-day clock! Temperatures are maintained with thermometer-measured fidelity, within a single degree of the warmth you wish. No chilliness at any time; and no over-heating.

Save the basement stairs; not because they are precious and should be protected—but because the drudgery of furnace tending is so entirely needless. Enjoy luxurious comfort, and freedom from heating bothers. "Let your pup be the furnace man!" Install Bryant Gas Heating.

No other home convenience can contribute so much to your family's comfort as this modern, carefree heating service. The cost is generally surprisingly moderate. Let the nearest of our 37 local offices provide you with a dependable estimate, for your particular home, of the probable gas fuel costs and the proper type and size of Bryant Gas Boiler or Gas Furnace.

THE BRYANT HEATER & MFG. COMPANY
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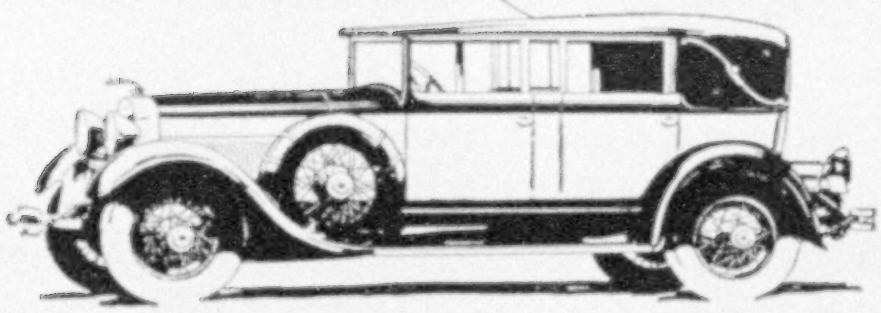
LINCOLN



Salon Favorites

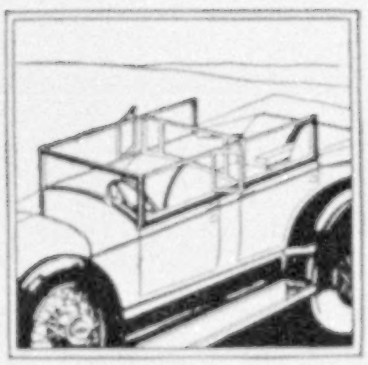
Among the finest motor cars of this country and Europe exhibited at the National Automobile Shows and Salons, four distinctly different Lincoln body types were favorites—a seven passenger Limousine, a Convertible Sedan, a Convertible Coupe, and a five passenger open Phaeton.

To win popular favor in so wide a range of appeal, is a sweeping endorsement of the custom body policy of the Lincoln Motor Company.

Every Lincoln body model is the creation of a master custom body builder It is not merely a passing sensation, but truly artistic and correct in line and proportion—lastingly beautiful. Its finish, appointments and upholstery are rich in quality but in every detail the restraint of good taste and simplicity is evident. Color combinations, in wide variety, sparkle with beauty and originality, yet never offend by too obviously seeking attention.

Lincoln custom bodies are designed to emulate the well balanced excellence of the Lincoln chassis. It is not enough that Lincoln shall be outstanding in any one feature; but rather it must be so outstanding in every feature of fine car quality and performance that it will satisfy every requirement. With brilliant speed, acceleration and beauty, there must also be smoothness of operation, stamina, long life, riding luxury, ease and sureness of control, safety, and economy.

Each and every feature must contribute its full part to the perfection of the Lincoln car as a whole.



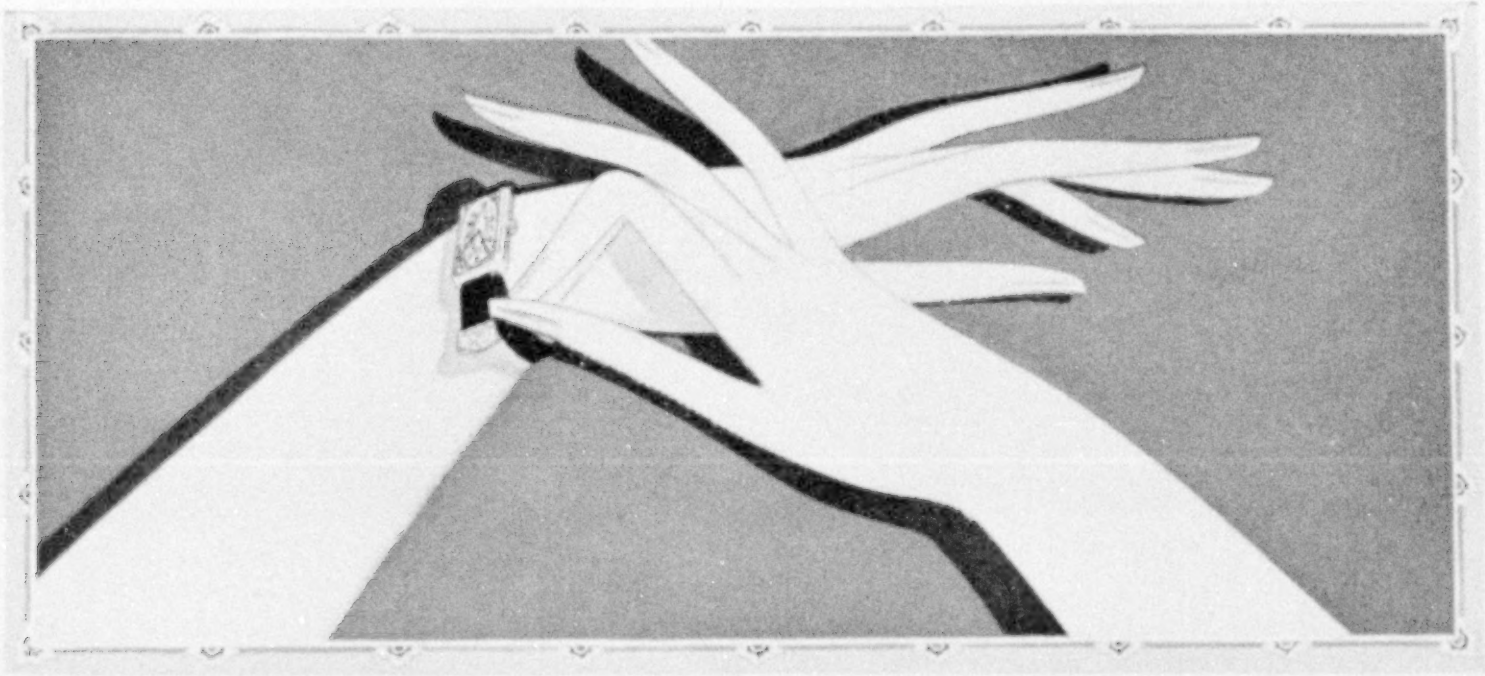
The Convertible Sedan as a beautiful open Phaeton—the glass in the doors and back of the front seat is now converted into windshields.

LINCOLN MOTOR COMPANY

DIVISION OF FORD MOTOR COMPANY

Lincoln cars range in price from $4600 to $7300, completely equipped, at Detroit

FORD RESOURCES SAFEGUARD YOUR LINCOLN INVESTMENT



Is it merely a beautiful ornament ...or is it a dependable timepiece?

Your jeweler tenderly places an exquisite wrist watch across your arm... You murmur your admiration as you finger and fondle it... And then a doubt interrupts your thrill.

Can this tiny and gorgeous adornment really be as practical as it is beautiful?

You need not remain in doubt ... The facts are yours if you ask the jeweler the following six questions:

[1] *Is it guaranteed to give satisfactory service; both by dealer and maker?* [2] *If so, has its maker been in business long enough to prove the worth of his guarantee?* [3] *In case of an accident, while in a foreign country or in a small, remote place, can this watch be easily and economically repaired by any local jeweler?* [4] *Are its parts standardized and carried by jewelers throughout the world?* [5] *Are its dimensions such that it is as practical as it is beautiful?* [6] *Can the dealer recall instances where this make of watch has served faithfully for many, many years?*

If it's an *Elgin*... you'll get definite and decisively favorable answers to all six questions.

Sponsored by a watch company which has uninterruptedly made fine watches for more than sixty years, an *Elgin* is not alone guaranteed to be an accurate timekeeper . . . but its service is guaranteed by *Elgin* jewelers in every part of the universe.

ELGIN

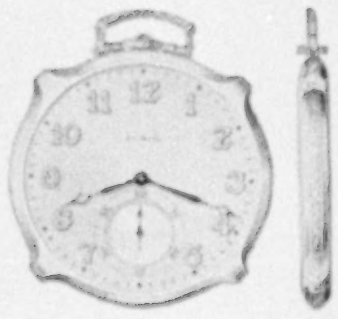
A 7*-jewel* ELGIN *movement in a gold-filled case, with luminous dial. Priced at* $40

Chastely engraved is the white gold case of this 15*-jewel* ELGIN *movement. Price,* $60

Tiny gems stud the white solid gold case of this unfailing ELGIN *movement. Price,* $150

A solid gold case, in white or green tone; 15*-jewel* ELGIN *movement. Priced at* . . . $60

Copyright ELGIN, 1928



An ELGIN *movement of* 17 *jewels in a* 14*-karat gold-filled case. Price,* $50. [*All prices are slightly higher in Canada*]

Signaling by smoke was a favorite method of the Indians. Messages were sent long distances by means of smoke released by a blanket held over a fire.

Grebe Waited

—and now you may have perfect light socket reception

WE know what you have been hoping for—in fact, rightly demanding of an electric set: tone—clear, true, natural, free from A-C hum; volume without distortion; ease of control; selectivity without loss of tonal fullness. No appliances of any kind to bother with.

Again and again the new Grebe A-C Six Radio has been tested until we *know* that it meets all requirements—that it offers perfect light-socket reception.

Like all Grebe sets it has enduring quality. There are no batteries or chargers; no outside eliminators or appliances of any kind. Just plug into the light socket and listen.

The Grebe way is to take time to *be sure*. During the nineteen years that we have been making radio apparatus, we have always waited to be certain that it was up to the high Grebe standard, before we placed it on the market.

Perhaps that is why Grebe sets have always been so satisfactory—why you can always "*get it better with a Grebe.*"

Experienced radio owners know what the name "Grebe" signifies. You, who have lately become radio interested, we urge to investigate the unsurpassed quality of Grebe reception. *Hear a Grebe A-C Six.* A Grebe dealer will gladly demonstrate. Send for Booklet N.

GREBE SYNCHROPHASE
A-C Six
RADIO

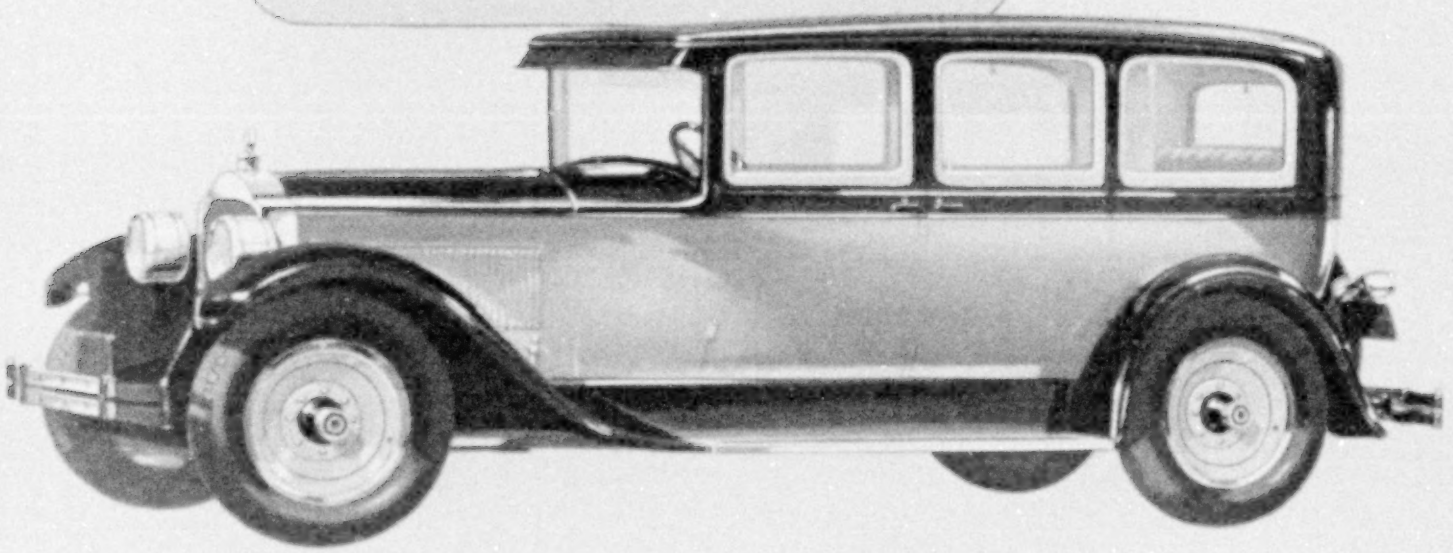
Grebe Synchrophase Seven $135.00
Grebe Synchrophase Five $95.00
Grebe Natural Speaker $35.00
Grebe Six-Point Speaker $17.50

A. H. Grebe & Company, Inc., 109 West 57th Street, New York City

Factory: Richmond Hill, N.Y. *Western Branch:* 443 South San Pedro Street, Los Angeles, California

Makers of quality radio since 1909

Greek artists depicted Hercules and Zeus on the dies cut to strike the gold coins of Alexander's world empire (300 B. C.)



PACKARD die cutters apply an ancient art with modern precision in making the dies for Packard forgings and stampings. Their work must be perfect that Packard parts may be perfect.

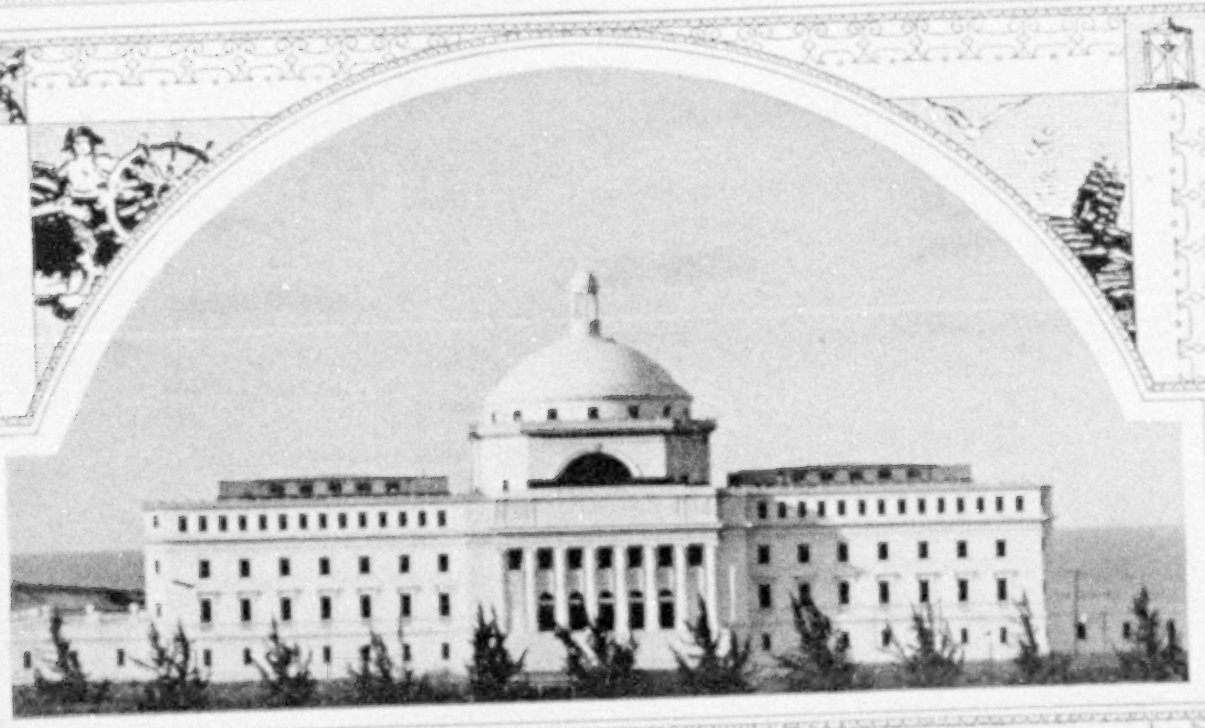
Fine materials and facilities alone could not maintain the Packard's reputation as the world's best built car. The talent, skill and experience, which for over a generation Packard has gathered and fostered in its men, are still more important.

Engineering genius, skilled craftsmen, long experience—these money cannot duplicate. They enable Packard to design and fabricate a car of watch-like precision, supreme beauty and lasting service.

Packard has never built a finer car, in design, materials or workmanship, than today's Packard Six. Yet the sedan, because it is the world's largest selling truly fine car, now costs less than half its introductory price of seven years ago.

PACKARD

ASK THE MAN WHO OWNS ONE



CAPITOL OF PORTO RICO
Raphael Carmoega, Architect

FRAMED by the blue of the sea, caressed by the tropical sun, the beautiful Porto Rican Capitol, symbol of the progress and stability of more than a million people, graces the harbor city of San Juan.

The entire exterior is of white Georgia Marble, each piece cut to exact size, sent to San Juan in three shiploads.

In selecting Georgia Marble for its Capitol, Porto Rico was assured of securing the material best suited to stand the exacting conditions of a tropical climate.

The hot sun and long tropical rains will try to take their toll in vain—season will follow season, and the beautiful Capitol of white Georgia Marble, *that perfect weathering stone*, will remain as beautiful as it is today.

The Georgia Marble Company
Tate, Ga.

NEW YORK
1328 Broadway

ATLANTA
Bona Allen Bldg.

CHICAGO
456 Monadnock Bldg.

GEORGIA · MARBLE

ROUND THE

World Cruise

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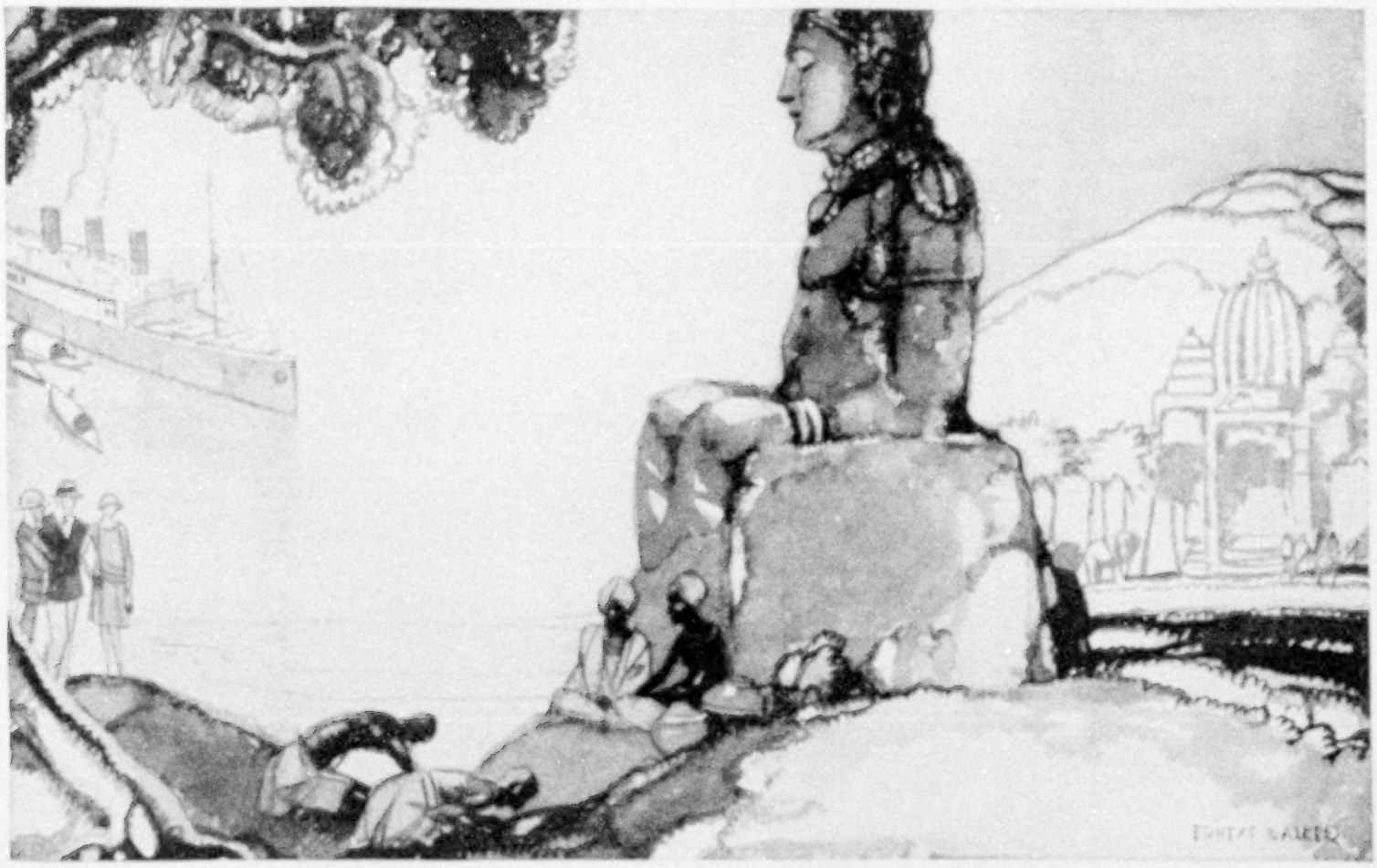

OVER 15,000 people have taken Canadian Pacific winter cruises. Over 2,000 have gone Round-the-World with Canadian Pacific.

And why not? A cruise costs no more per day than comparable living on shore. You live with equal ease and luxury. You bury responsibility sixty fathoms deep; the scenery changes every day.

For 1928, the feature cruise is again the Round-the-World Cruise. Imagination cannot conceive four months spent so pleasurably, so profitably . . . First, a continuous round of lifetime experiences. Christmas in the Holy Land. New Year's in Cairo. India in cool, gay January. Exotic Siam and China. Japan for the plum blossoms. Easter in Havana. The circuit of the wonder-belt of the world.

Second, the incredible smoothness of this 30,000-mile program . . . made possible by the world's greatest travel system. Canadian Pacific has its resident agents everywhere. It maintains daily organized service two-thirds round the globe. It is official agent in North America for the State Railways of India.

Finally, wonderful living. The ship again is the Empress of Australia, 21,850 gross tons. 3-room royal suites. Roman bath. Rooms of amazing spaciousness and airiness.

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(All from New York)

South America - Africa. 104 days. Jan. 22, 1929. Empress of France.

Mediterranean. 72 days. Feb. 4, 1929. Empress of Scotland.

West Indies. 29 days. Jan. 24; Feb. 27, 1929. Duchess of Bedford (new).

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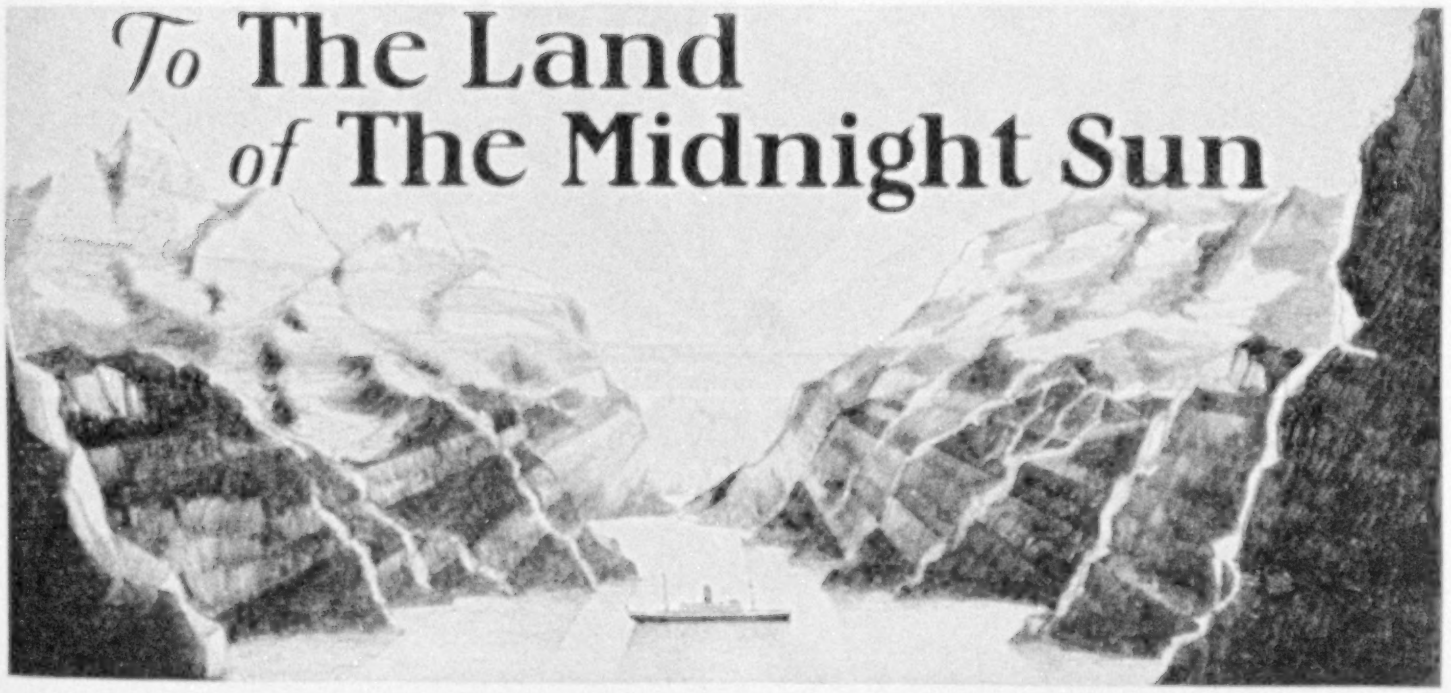

And Norway's Magnificent Fjords

ICELAND with its boiling springs and frozen glaciers . . . The North Cape rising from the Top of the World . . . a colony of Lapps with their strange mudhouses . . . old Viking hamlets and famous Scandinavian cities . . . lie in the route of James Boring's forty day cruise to the Land of the Midnight Sun, which sails from Montreal on the specially chartered White Star Liner *S. S. Calgaric*, on June 21st.

This cruise, with its stopover privileges allowing return via New York, offers a vacation full of refreshing new sights and a fascinating route to Europe. It occurs at a time when the temperature of Norway's coast is mild as June and days in the far North are weeks long.

Mr. Boring himself and his efficient staff will accompany the cruise to relieve its members of the time wasting details of travel.

One moderate fee, from $550 for comfortable accommodations to $1275 for the best on the ship, pays every necessary expense—both on ship and on shore. There will be no class distinction.

The membership is limited to 480. Consult your local agent at once, or send immediately for the descriptive literature with cabin diagram and rates.

Our Itinerary

Montreal	Merok
Quebec	Balholm
Iceland	Bergen
Hammerfest	Copenhagen
North Cape	Stockholm
Lyngen	Germany
Trondhjem	Holland
Molde	England
	New York

Stop-over privileges

Another James Boring's Cruise—Fourth Annual Cruise to the Mediterranean—*Sailing February 9, 1929*

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NEVER BEFORE in Your Lifetime

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160th Anniversary SALE

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Read these Great Messages!

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—*Charles Evans Hughes*

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—*S. Parkes Cadman*

THE GREAT 160th Anniversary Sale of the Britannica is now in full swing. The response to our first announcement has been tremendous. Thousands of people who have always wanted the Britannica, but imagined they could not afford it, are now taking advantage of this opportunity.

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If *you* have considered the Britannica beyond your means, this great Anniversary Sale will banish your doubts immediately. The NEW LOW PRICE now places this incomparable work within reach of *every* home. And, once you actually own a set of the Britannica, you will never regret your purchase. For the Britannica is a constant source of inspiration and enjoyment—an indispensable part of *every* library.

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While this offer lasts, you can buy the very latest Britannica in the NEW FORM, at *the lowest Price* at which this latest and greatest edition has *ever* been offered.

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Recently built, great, modern, oil-burning ships, of 20,000 tons each . . . commandeered from the first class service to meet a clamorous demand for aristocratic accommodation at low rates . . . hot and cold water in every room . . . de luxe suites and private baths . . . the year's most valuable contribution to travellers who consider both comfort and economy. The Scythia and Laconia will maintain a regular cabin service to Queenstown and Liverpool.

The 1928 Caronia and Carmania remodelled from stem to stern

Beds where berths used to be . . . hot and cold running water in every room . . . a Winter Garden and crack gymnasium . . . two glass-enclosed promenade decks . . . the same charm . . . the same ship-shapeness . . . all the old-fashioned touches eliminated . . . The Caronia and Carmania will run to Plymouth, Havre and London.

The CUNARD CABIN fleet has become everybody's travel solution — offering an experience actually comparable to buying a Rolls-Royce at Ford prices. Cabin rates now $152.50 . . . Tourist Third Cabin $107.50 with specially reduced round trip rates.

For full information apply to your nearest steamship agent or to the

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1840 · EIGHTY · EIGHT · YEARS · OF · SERVICE · 1928

From Girlhood Days

she used this dentifrice and now her smile is envied everywhere

AS a child, that radiant smile, revealing two rows of beautiful white clean teeth, brought her admirers, invitations, friends.

And, as a child, she began using Colgate's. "It is so long ago," she declares, "I cannot remember when I bought my first tube."

The photograph shows you the kind of smile she has today, and in that smile you see how little change the years have made in that stunning set of teeth.

In this country, and in

Miss Lynch as a schoolgirl

foreign countries the world over, you will find thousands and thousands of men and women who began using Colgate's ten, fifteen, even twenty years ago, and whose teeth today are exceptionally sound and beautiful.

Many of these people are grateful enough to write to us. Some send their photographs also. Many of these letters come from users who have brushed with Colgate's for at least a decade.

Ever since the days of hair-ribbons, Miss Lynch has brushed her teeth with Colgate's

CLEAN!

Years ago we set out to make the best dentifrice possible. We interviewed leading dental authorities. They told us that the one thing a dentifrice should do is to clean teeth. We then produced Ribbon Dental Cream — designing it to do that one thing superlatively well. It is not medicated, because all experiments in the meantime have sustained the original principle that cleansing is the only thing a dentifrice can do.

Colgate & Co.
Est. 1806

There is nothing mysterious about these enviable results. The men and women fortunate enough to secure them did nothing that you cannot easily do yourself.

They visited their dentists for periodic inspections. And they used Colgate's Ribbon Dental Cream.

Choose your dentifrice on the basis of results. Follow the lead of those who have already kept their teeth sound for years. Simply adopt for your own use the dentifrice most popular among people with well-preserved teeth.

Also, wouldn't it be an immense satisfaction to know that the dentifrice you were using was the one which dentists recommend most frequently?

So, for lovely teeth—for teeth that make your smile the social and business asset that it should be—ask your druggist today for Colgate's. Or, if you prefer, try the free sample offered in the coupon.

Colgate & Co., Dept. 205-C, 595 Fifth Ave., New York
Please send me a sample of this cleansing dentifrice.

Name_____

Address_____

In Canada, Colgate & Co., Ltd., 72 St. Ambroise St., Montreal

THROUGH THE NIGHT

A COLD night, crystal clear, with skid chains ringing on the frozen highway, the keening wind cutting like a knife through cloth and fur, a silver mist of frost dazzling the moonlight . . . a night to be snugly indoors! *Yet the great mail plane drones overhead!*

Whether it is a night of cold or a night of heat, thunderous and oppressive, with clouds of dust spiralling upward even in the dry darkness . . . or a night of drizzling rain, with the pat-pat-pat of waves sending fear into the hearts of those who live by the banks of rising rivers . . . these couriers of the sky fly on their appointed courses.

Above the flood or on the edge of the blizzard they are blazing new routes to serve a higher civilization than the world has yet known.

For the most modern forms of industry and the most modern needs of commerce definitely demand greater speed not only in communication, but in transportation. Telephone and radio have tremendously increased the exchange of constructive ideas. The automobile has speeded up the interchange of products.

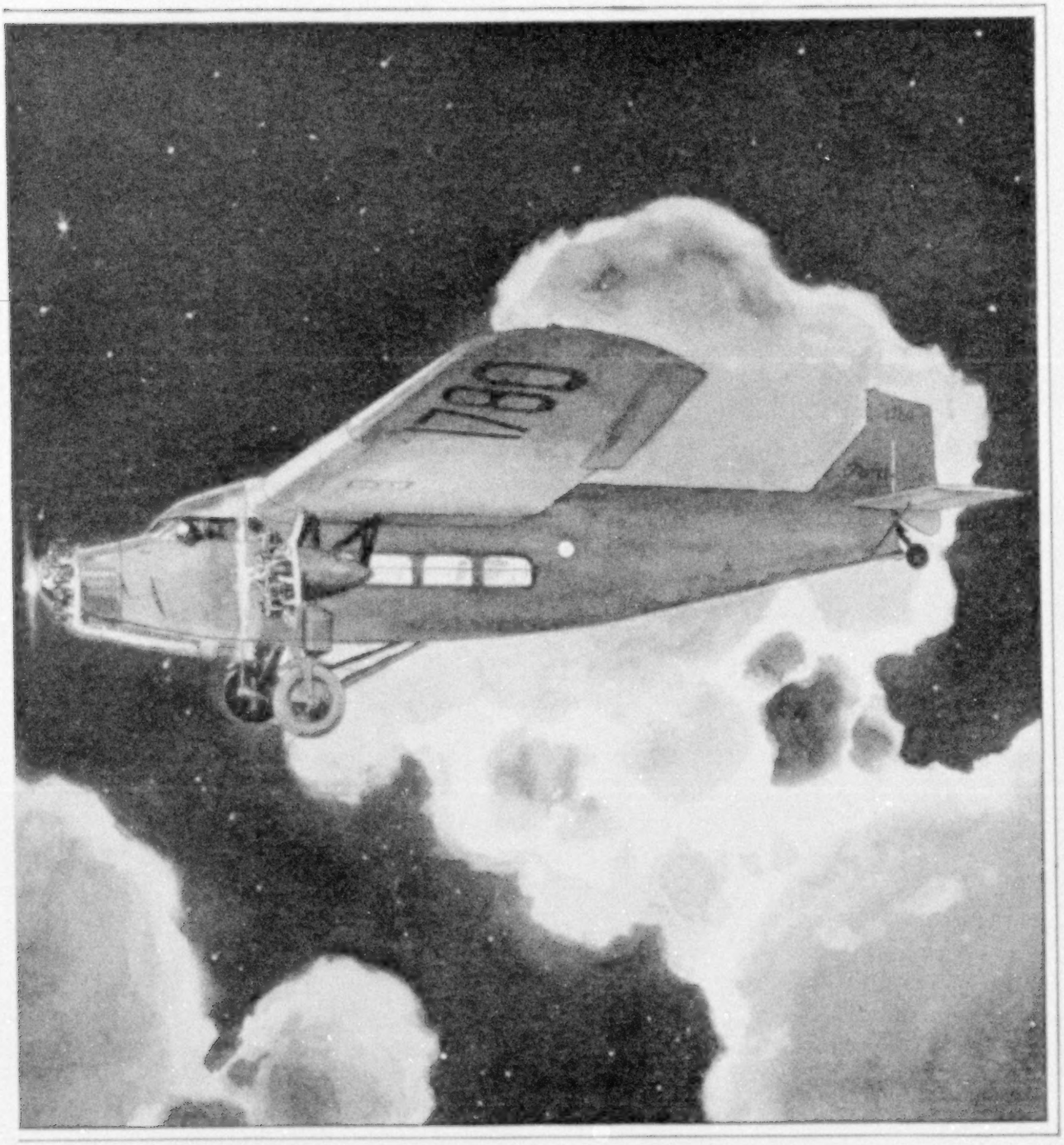
He who can command safe speed in excess of his competitors in the performance of contracts will almost infallibly take the lead in nation-wide business.

This country is now measured not in terms of political frontiers, but in terms of trade areas. And trade areas are clearly limited by transportation facilities. Is it not significant that by June of this year air-mail planes of the United States will be flying 25,000 miles daily —a distance equal to the circumference of the earth at the Equator? With 80 station stops, these planes will be serving trade areas that embrace 62,300,000 people!

The weight of mail carried on airways between New York and San Francisco, with some duplication, during 1927, was over 750,000 pounds! The value of bank checks transmitted was approximately $7,200,000,000! Mail and express included publications, photographs, jewelry, moving-picture films, samples.

These figures are for mail and express only, exclusive of freight; *for the Ford lines alone, operating between Detroit and Cleveland and Detroit and Chicago, transported in* 1926, *a total of* 1,730,000 *pounds of freight!*

The Ford Motor Company is in a particularly fortunate position to gauge the



commercial importance of this great industry that is being born. Do not measure the service of commercial planes in terms of wartime standards; for they are types of a new epoch, designed for safety, speed and utility—looking upward to an expansion of swift safe service that will reach to the ends of the earth.

Already the industry has reached the stage of close competition in passenger traffic . . . in production . . . and in increasing demands that exceed the available supply of dependable equipment. *By the performance of air-mail and commercial planes both in America and abroad, flying day in and day out on regular schedules, you may best judge the capabilities of the most modern planes.*

It is in such planes . . . products of Ford factories, and of the factories of equally far-sighted pioneers of the commercial epoch in the air . . . that the mail is being carried from end to end of this country!

"Neither snow, nor rain, nor heat, nor gloom of night stays these couriers, from the swift completion of their appointed rounds."

FORD MOTOR COMPANY

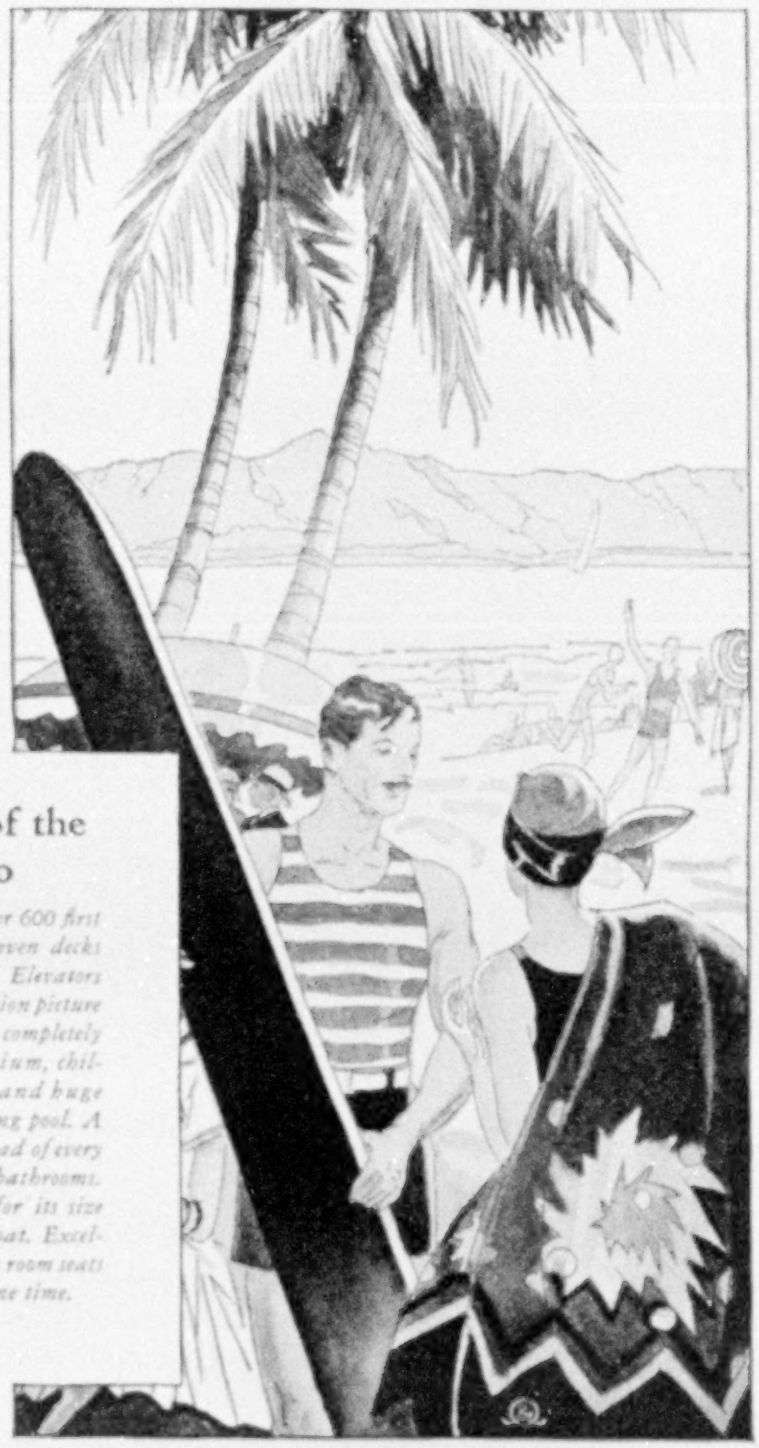
hawaii · · Waikiki

Romantic places you've always wanted to see
Go now on the Malolo

AN EMERALD set in the blue Pacific . . . an island paradise—Hawaii. Four days beyond the Golden Gate its pleasures are waiting for you; its fascinations are eager to claim you. Think of swimming off Waikiki in the moonlight; think of golf on a famous mid-Pacific course;—think of strangely delicious new foods to eat, new sights to see, new sports to enjoy!

Why not go now? Glamorous Hawaii is now but four short days from the mainland. Even from New York it is but three weeks' round-trip.

The splendid new MALOLO, swiftest and most luxurious passenger vessel ever built in the United States, sails from San Francisco every other Saturday. She makes the passage in the amazing time of only four days. Let this year mark the happy event of your Hawaiian holiday. There are one or more Matson sailings from San Francisco every week. Regular sailings from Seattle, too. All-expense independent tours of Hawaii from $275.



Features of the Malolo

Accommodations for 600 first class passengers. Seven decks for passengers' use. Elevators serve all decks. Motion picture theatre. Ballroom, completely equipped gymnasium, children's playroom and huge Pompeian swimming pool. A telephone at the head of every bed. 150 private bathrooms. More deck space for its size than any ship afloat. Excellent meals. Dining room seats all passengers at one time.

Australia
and the South Seas

If you should wish to travel farther—to the South Seas, Fiji, Australia—Matson liners are ready to take you comfortably, swiftly. Sailings every 21 days.

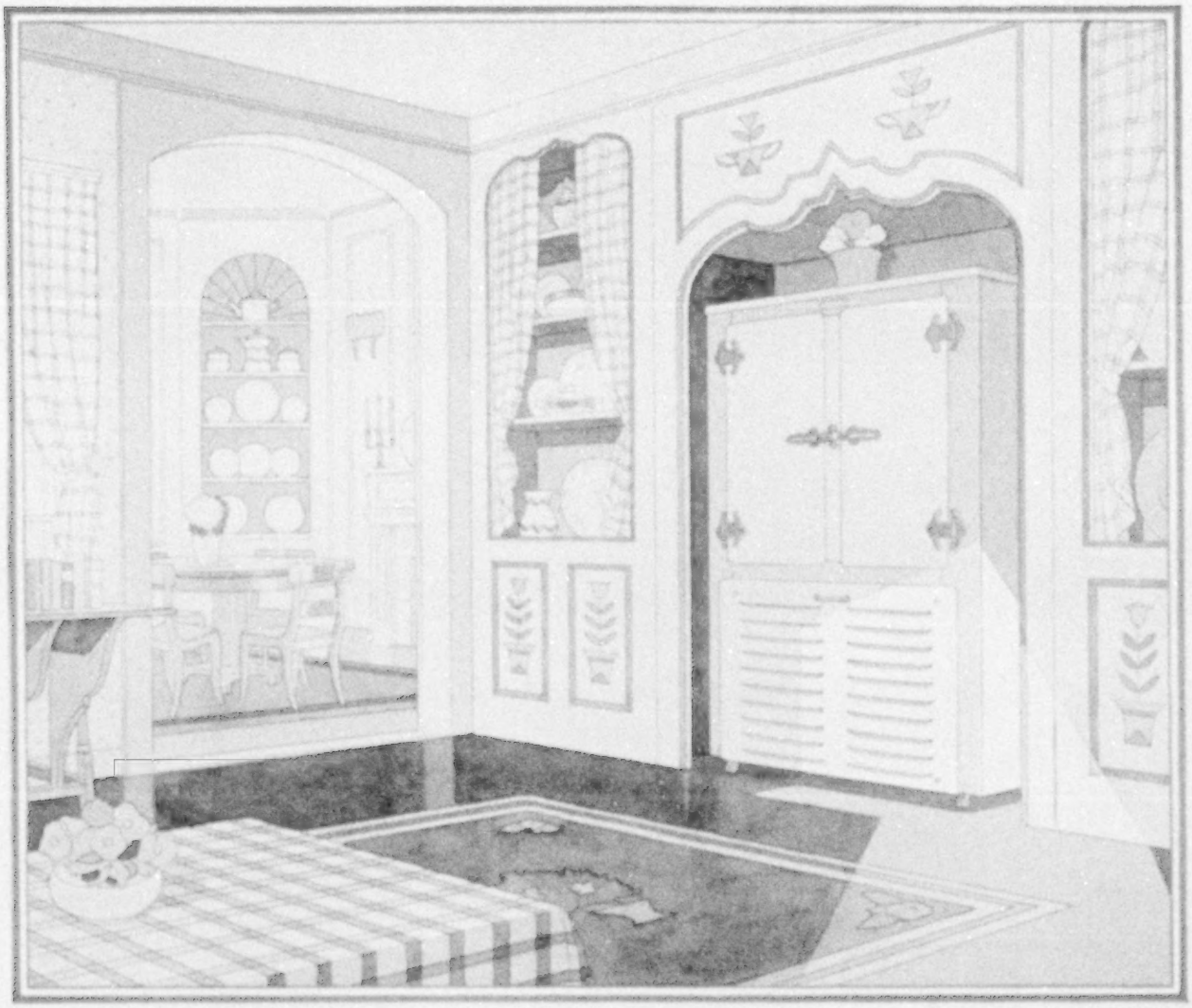
Matson line
Hawaii · South Seas · Australia

For information about Matson tours inquire at our nearest office or at any travel agency

Write Matson Navigation Company, Dept. 21-B at any of the following addresses: 215 Market St., San Francisco 535 Fifth Ave., New York—140 So. Dearborn St., Chicago—510 W. Sixth St., Los Angeles—1319 Fourth Ave., Seattle

FRIGIDAIRE

THE CHOICE OF THE MAJORITY



The modern trend toward decoration and utility in the kitchen is exemplified in this new Frigidaire with Tu-Tone porcelain-enameled cabinet of classic beauty. With its proved dependability and economy, Frigidaire may now be secured in a wide variety of cabinet styles and sizes. Or the Frigidaire equipment may be installed at low cost in any good refrigerator. Today Frigidaire safeguards foods and brings priceless health protection to

÷ ÷ more than half a million users. Frigidaire Corporation, Dayton, Ohio ÷ ÷

FRIGIDAIRE

PRODUCT OF GENERAL MOTORS

NORTHERN PACIFIC

YELLOWSTONE PARK LINE

Down the Columbia River Gorge

drop the waters of Multnomah Falls— in a ribbon of silver spray more than six hundred feet long. There are many waterfalls along the Columbia River Highway and mountains rise above the road to pierce the blue of the sky.

The Pacific Northwest is a country of color and freshness—fragrant with orchards—cool with its lakes and its forests, with sports and scenery to match every mood!

The assurance of faultless service on the beautifully appointed "North Coast Limited" adds to the appeal of a trip to the Pacific Northwest. It follows the trail of Lewis and Clark—the direct route to the North Pacific Coast.

May we help you plan a vacation in the Pacific Northwest? Please mail the coupon.

Northern Pacific Railway

Mail this coupon to A. B. Smith, 685 Northern Pacific Building, St. Paul, Minn.

(33)

MY VACATION TRIP

Name .....

Address .....

My telephone No. is .....

If student, state school and grade .....

The "North Coast Limited" Sets the Pace Out West!

Books or trips I am interested in (√)	Round Trip Summer Fare from Chicago
☐ Pacific Northwest } Portland / Seattle / Tacoma	$90.30
☐ Rainier Park }	90.30
☐ Dude Ranch Vacations	$57.95 to 66.90
☐ Yellowstone Park	59.35
☐ Rocky Mountains (Helena—Butte)	61.95
☐ Inland Empire (Spokane)	85.05
☐ Alaska (Skagway)	180.30
☐ Burlington Escorted Tours (all expense)	$148.00 to 240.00

DON'T *cover* the worn spots

..make them look like new!

Here is an astonishing machine that scrapes, waxes and polishes your floor at a fraction of the usual cost

AN AMAZING new machine which plugs into an electric light socket like a vacuum cleaner, and requires no more skill to operate, enables you to do the job yourself.

It takes off completely the old varnish or shellac . . . sandpapers the floor to velvet smoothness . . . vigorously rubs in coats of wax . . . then polishes the wax to a lovely lustre.

The change in your floors astonishes you. *They look like new.*

Not only that—but they stay that way, for the machine takes care of them forever after.

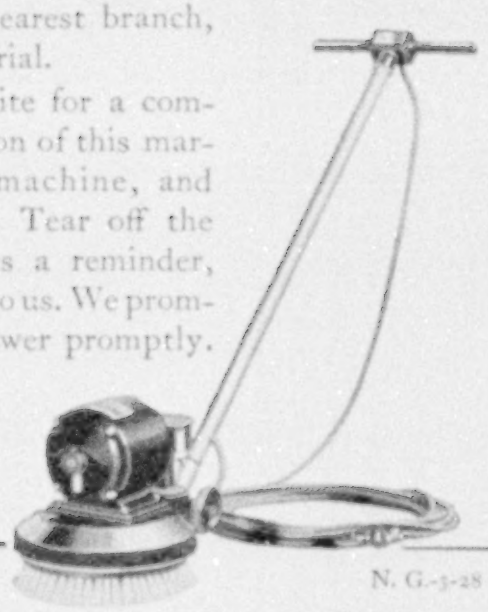
A few minutes' occasional polishing, an annual or semi-annual rewaxing (operations absurdly easy), and your floors become the constant envy and admiration of your friends.

In addition, the Ponsell Floor Machine takes care of your other floors.

It gives linoleum a lustre surpassing anything you have ever known . . . a surface so immaculately smooth that dust and dirt have a hard time sticking to it. The machine scrubs tile, cement, or any other kind of floors as they never could be scrubbed by hand, and without the least splashing.

We have branch offices in 24 cities ready to serve you. Upon request, we offer a *free* demonstration in your own home. Or if you are too far from our nearest branch, a 10-day *free* trial.

But first write for a complete description of this marvelous little machine, and what it does. Tear off the coupon now as a reminder, and then mail to us. We promise you an answer promptly.



N. G.-3-28

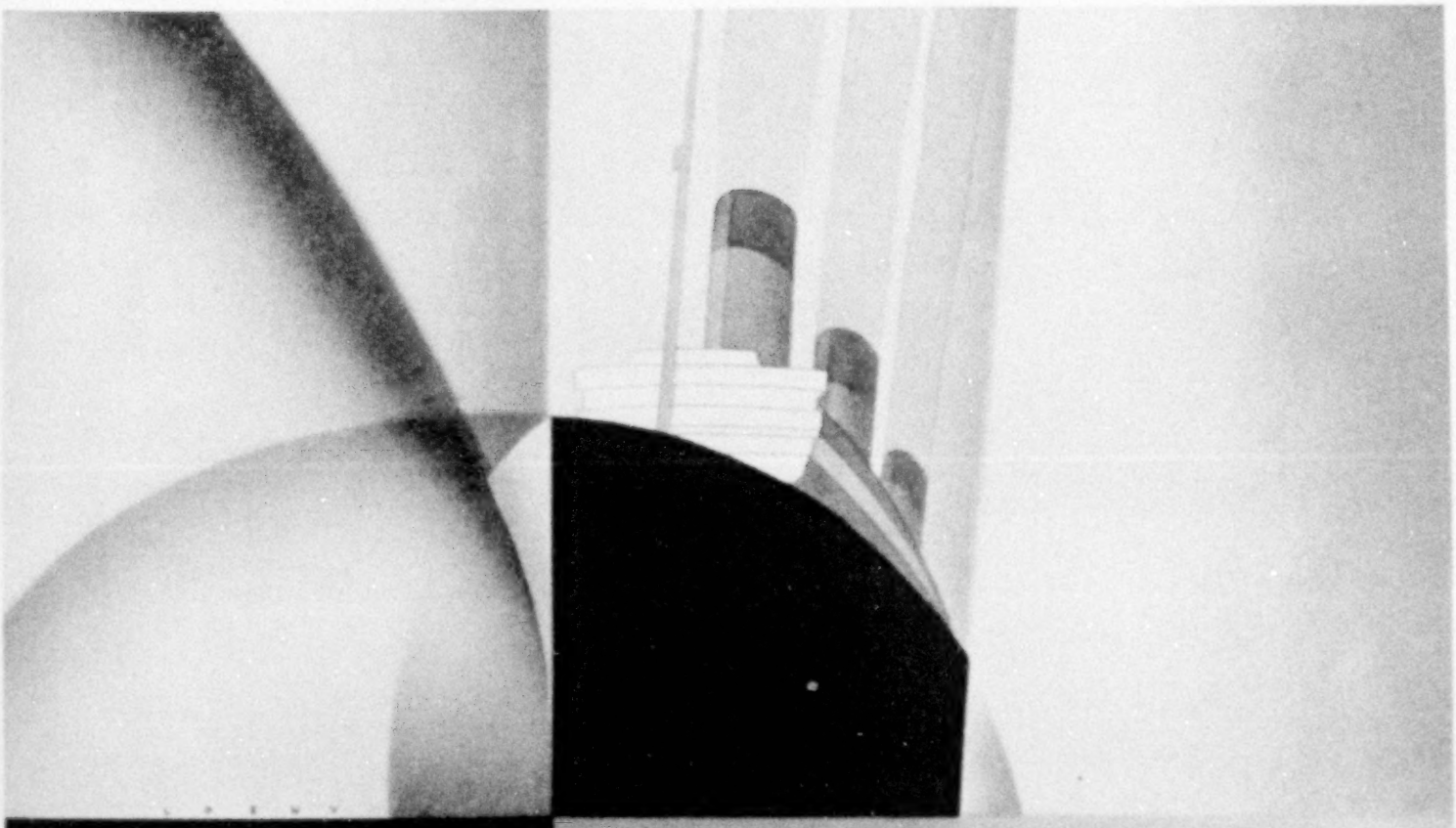
Ponsell Floor Machine Co.
220-230 West 19th St., Dept. 123, New York City.

Please mail me complete information and prices regarding your Electric Floor Machine. This does not obligate me in any way whatever.

Name.....

Address.....

City..... State.....



MODERN SERVICE

Exemplified by the White Star, Red Star and Atlantic Transport Lines in ships that are the great, swift swallows of the seas—sure and precise in their speed. Where the requisites of the smart set are anticipated. Where the appetite of the epicure is appeased by an excellent cuisine. Where the comforts of the "home-folks" are included and not disdained . . . . Luxury—comfort—service—speed. A ship for every purse and plan.

Apply No. 1 Broadway, New York City; our offices elsewhere or authorized agents.

ULTIMOST OCEAN SERVICE
IMM

WHITE STAR LINE

RED STAR LINE · ATLANTIC TRANSPORT LINE
INTERNATIONAL MERCANTILE MARINE COMPANY

How to bring

the whole world to your home

in living action

BEAUTIFUL home movies of your travels or *any* event is the subject of a fascinating new booklet you may have for the asking.

Read on the very first page the many uses for movies in your daily life, whatever your vocation may be. The *traveler* will learn here how to bring home the vivid life of other lands. For the *parent* there is information on making immortal movie records of the children.

Life is everywhere about *you*, throbbing, pulsating with interesting action. With childish ease you can use a Filmo Camera to capture and perpetuate it *for all time.*

To take beautiful motion pictures with Filmo Camera simply look through the spy-glass viewfinder and press the button. Only these two simple operations are necessary. Easier than taking snapshots. No focusing for distance, no setting for time, no winding films, no special skill of any kind required.

For twenty-one years the greatest productions of Hollywood have been made with Bell and Howell professional cameras costing up to $5000 each. The principal exclusive features of these cameras are built in Filmo, thus assuring professional quality for amateurs.

The film used in Filmo Camera is obtainable at practically all stores handling cameras and supplies. It is Eastman Safety Film (16 mm), in the yellow box. No extra charge is made for developing your films and returning them, postpaid, to you.

Then Filmo Projector brings back your movies with all the brilliant beauty of those shown in theatres. Additional films (Filmo Library) can be purchased or rented from any Filmo dealer to add *variety* to your home movie entertainment.

You incur no obligation by asking for the new Filmo booklet which gives you complete information on all the above. Use this convenient coupon to secure your copy by return mail.

Filmo
REGISTERED
BELL & HOWELL

There is also Eyemo camera, using standard (35 mm.) film for those desiring to commercialize their movies.

BELL & HOWELL CO.
1817 Larchmont Ave., Chicago, Illinois
New York, Hollywood, London (B & H Co., Ltd.) Established 1907

BELL & HOWELL CO.
1817 Larchmont Ave., Chicago, Ill.

Please send me your latest Filmo booklet "Home Movies of the Better Kind."

Name .....

Address .....

City ..... *State* .....

A more wonderful

New playlands, new havens of rest, vacation enjoyment in endless variety now opened to you

Have you seen the long famous sights of Colorado—Colorado Springs, Long's Peak, etc.? If so, you have had only a hint of the new Colorado now opened to you!

New highways, with reliable motor service (making your own car unnecessary) now lead to wonder-spots where sight-seeing is only one feature of a glorious vacation

Deep in the mountains new playlands, new havens of rest have been opened up—places you can go and enjoy yourself in any way you please . . . carefree, happy

If you are at your best whipping a trout stream—you'll get a new thrill out of fishing here, just as you'll get a new thrill out of everything else you do in Colorado

Golf, for example, is a different game on Colorado's mountain courses. There's something in the air that makes you play harder, feel better, enjoy everything more

And, by all means, don't let the children miss all this! Turn them loose and watch them grow as brown as little Indians. You can afford it—the cost is so low

THIS summer—let's be on our way!

You have time enough—two weeks is ample. The Burlington takes you to Colorado in only a day and a night from Chicago or St. Louis.

You can afford it. Round-trip summer vacation fares are surprisingly low. The cost will be no greater than an ordinary vacation near home.

Send for the big, free Vacation Book. You will be astonished to find how easily you can have a glorious Colorado vacation.

Take along the children—and leave all care at home! The Burlington takes you to Colorado quickly, pleasantly and at the lowest cost. In Colorado comfortable motors, operating on regular schedules, serve the various mountain regions.

Three fine trains daily from Chicago and Omaha and two from St. Louis and Kansas City provide a service that anticipates your every travel wish—a service so fine and complete that it has made the Burlington known everywhere as "the most popular route to the Rockies."

At moderate additional cost you can also have your Burlington ticket take you to Yellowstone and Glacier National Parks. Only the Burlington's *complete* service to the entire Rocky Mountain region makes such vacation bargains possible.

This summer—you *can* go. Send for the big Vacation Book and begin planning *now*.

Burlington Route

Burlington

COLORADO!

Bargain vacations — 2 weeks or longer. Send for Free Illustrated Book containing full information

Here you will find luxurious hotels with every convenience, inns, lodges, cottages,—as you prefer. Convenient lodgings and board for as low as $17.50 a week!

This new Colorado is not merely a place to see things. Above all it is a place to do things. This couple have just scaled Mt. Evans —14,000 feet above the sea

While some prefer just blessed ease, most everybody rides in Colorado. A hundred skyland trails await you. This is in Rocky Mountain National (Estes) Park

By the way, there's the wild animal life—interesting to camera hunters in this country so wild, yet so well equipped with modern conveniences. Bison near Denver

Remember, too, there is lots to see along the way from the Burlington's famous sun-porch observation cars. Your vacation fun starts when you board your train

The Burlington has won the largest patronage of Rocky Mountain vacationists given to any railroad. Its equipment, service, hospitality are pleasantly remembered

Big Vacation Book FREE

What can you do in two weeks (or longer) in Colorado this summer? This big, profusely illustrated Vacation Book tells you. It takes you on an easy-chair tour as absorbing as fiction. It shows you exactly what each dollar of your vacation money will buy in Colorado. Please accept it with our compliments. Send the coupon and begin planning your greatest vacation—now.

Burlington Escorted Tours

A new, carefree way to see the Rockies—with a Burlington Escorted Tour party. Definite cost covering all necessary expenses. Everything planned in advance. Travel expert with each party. Mark coupon for Tours Book.

Burlington Travel Bureau, Dept. NG-1
547 West Jackson Blvd., Chicago, Ill.
Please send me your free Colorado Vacation Book.

Name.....

Street.....

City.....

☐ Mark X here if you wish book on Burlington Escorted Tours.

Route

The most popular route to the Rockies

Apparently safe with teeth so glistening white YET...

WHEN the regular brushing of teeth keeps them as flashing as a pearl, all seems so safe.

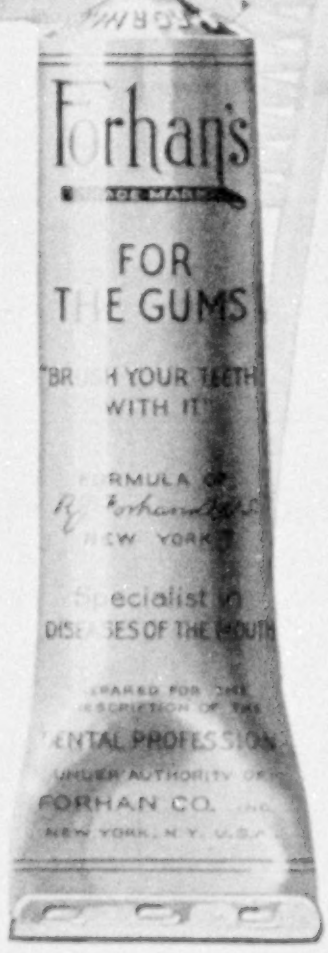
Yet . . . there is an insidious foe which ignores the teeth and attacks the gums. Unaware of this fact, 4 persons out of 5 after forty and thousands younger sacrifice precious health. And needlessly too, because this sworn enemy of mankind—Pyorrhea, avoids firm, healthy gums.

So take this precaution: Use a dentifrice that keeps teeth white and also helps to firm gums and keep them healthy. As you know, Pyorrhea seldom attacks healthy gums.

Daily, every morning and every night, brush teeth and gums with Forhan's for the Gums.

Without the use of harsh abrasives it cleans teeth, restores them to their natural whiteness and protects them from acids which tend to cause decay.

It is the formula of R. J. Forhan, D. D. S., for many years a Pyorrhea specialist. And it is compounded with Forhan's Pyorrhea Astringent, used by dentists in the treatment of Pyorrhetic conditions.



Take precautionary measures that will help to safeguard you against the ruthless attack of Pyorrhea. See your dentist at least twice each year. Have him examine teeth and gums thoroughly. And start using Forhan's for the Gums, morning and night, every day. Teach your children this good habit. They'll thank you in later years. Get Forhan's from your druggist. In tubes, 35c and 60c. Forhan Company, New York.

Formula of R. J. Forhan, D. D. S.

Make This 10 Day Test

Lazy, lethargic gums invite disease. And the only way to keep them firm, sound and healthy is to massage them daily just as a woman massages her face to keep it glowing with youth and free from the signs of age. Forhan's for the Gums is designed for gum massaging. Make this 10 day test. Morning and night, before brushing your teeth with Forhan's, exercise your gums, closely following the directions in the booklet that comes with each tube . . . See how much better they look and feel! *Your Teeth Are Only As Healthy As Your Gums.*

Forhan's *for the gums*

YOUR TEETH ARE ONLY AS HEALTHY AS YOUR GUMS

WHERE LIFE IS BETTER

CALIFORNIA

Monterey peninsula near San Francisco

More cars — more days to use them — more money to buy them

IMAGINE—today—along the highways right where you live, a sun-swept ocean, orchard-covered hills and valleys, ancient Missions, the cathedral aisles of giant redwood groves thirty centuries old, Yosemite Valley—and you have a glimpse of what *winter* motoring is like in San Francisco and Central California!

For, in California, not only do we have plenty of automobiles—we *use* them all year 'round. Our five million people own 2,000,000 cars—more than one for every family in the state, and about twice as many, proportionately, as the average of other states.

Automobile ownership is only one of *many* indexes of this bed-rock, dollars-and-cents prosperity that you will find in San Francisco and all over California.

We pay twice as much income tax for our population as the national average. About twice as many of us have savings bank accounts, with an average deposit twice the average for the rest of America. To us, California has proved itself a land of doubled opportunity—for success as well as for the zest of living.

San Francisco

Start in at San Francisco, the industrial and Commercial capital of the Pacific Coast and the gateway to Hawaii, Australasia and the Orient. Go north or south through her rich trading area of fine cities and splendid farms—see how opportunity is written for anyone with reasonable capital and ability to get along!

"California, Where Life is Better"—a 48-page illustrated booklet published by Californians Inc., a *non-profit* organization devoted to the sound upbuilding of the state, tells you much more about California. Write for it today—use the coupon below!

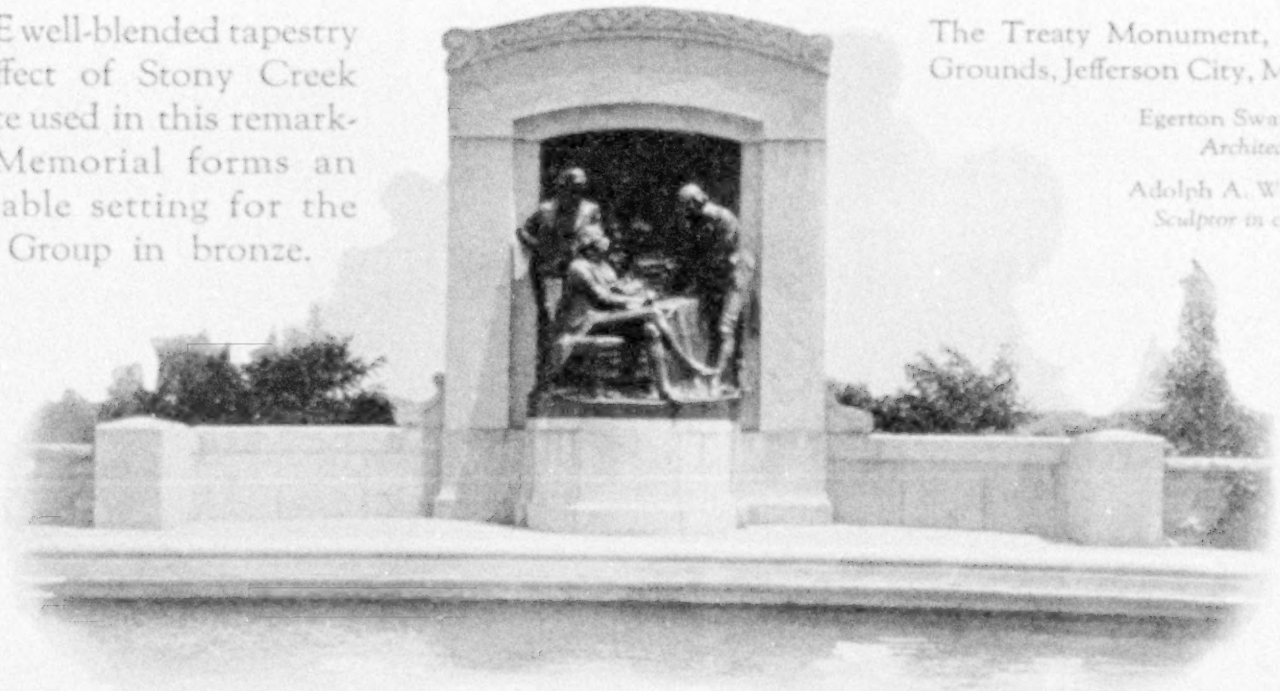
CALIFORNIANS INC. **SAN FRANCISCO**

Californians Inc., Room 503, 140 Montgomery St.: Please send "California, Where Life is Better."

Name _____ *Street* _____

City _____ *State* _____

THE well-blended tapestry effect of Stony Creek Granite used in this remarkable Memorial forms an admirable setting for the Relief Group in bronze.



The Treaty Monument, Capitol Grounds, Jefferson City, Missouri.

Egerton Swartwout, *Architect.*

Adolph A. Weinman, *Sculptor in charge.*

THROUGH the genius of the Sculptor and the skill of the Architect, great events in history may be beautifully and permanently portrayed throughout the ages by the use of Granite, Nature's everlasting material.

Write for your copy of the handsome book, "Modern Memorial Art."

Chicago Studios:
BUILDERS' BUILDING
La Salle Street and Wacker Drive

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STONY CREEK, CONN.

The DODDS GRANITE COMPANY

Established 1864
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Exclusive Producers:
MILFORD PINK GRANITE
VICTORIA WHITE GRANITE
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Above Names Protected by Trade Mark

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you can read "Investing for Safety", our new booklet, which you will find to be a valuable guide in solving your investment problems and to aid you in choosing sound securities. It will be sent without charge or obligation. Simply write and ask for

BOOKLET C-1808

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Investment Bonds Incorporated

STRAUS BUILDING
565 *Fifth Avenue*
at 46th St.
NEW YORK

STRAUS BUILDING
Michigan Avenue
at Jackson Blvd.
CHICAGO

ESTABLISHED IN 1882

Look Inside the Piano for this Trade Mark

WESSELL, NICKEL & GROSS
NEW YORK
TRADE MARK

The Sign of the World's Standard Piano Action

This is the Piano for Your Child

YOUR child will make better progress in music study on a piano equipped with the Wessell, Nickel & Gross piano action! For the perfect balance and delicate responsiveness of this action are of inestimable aid to little fingers in daily practice and in acquiring correct habits of touch.

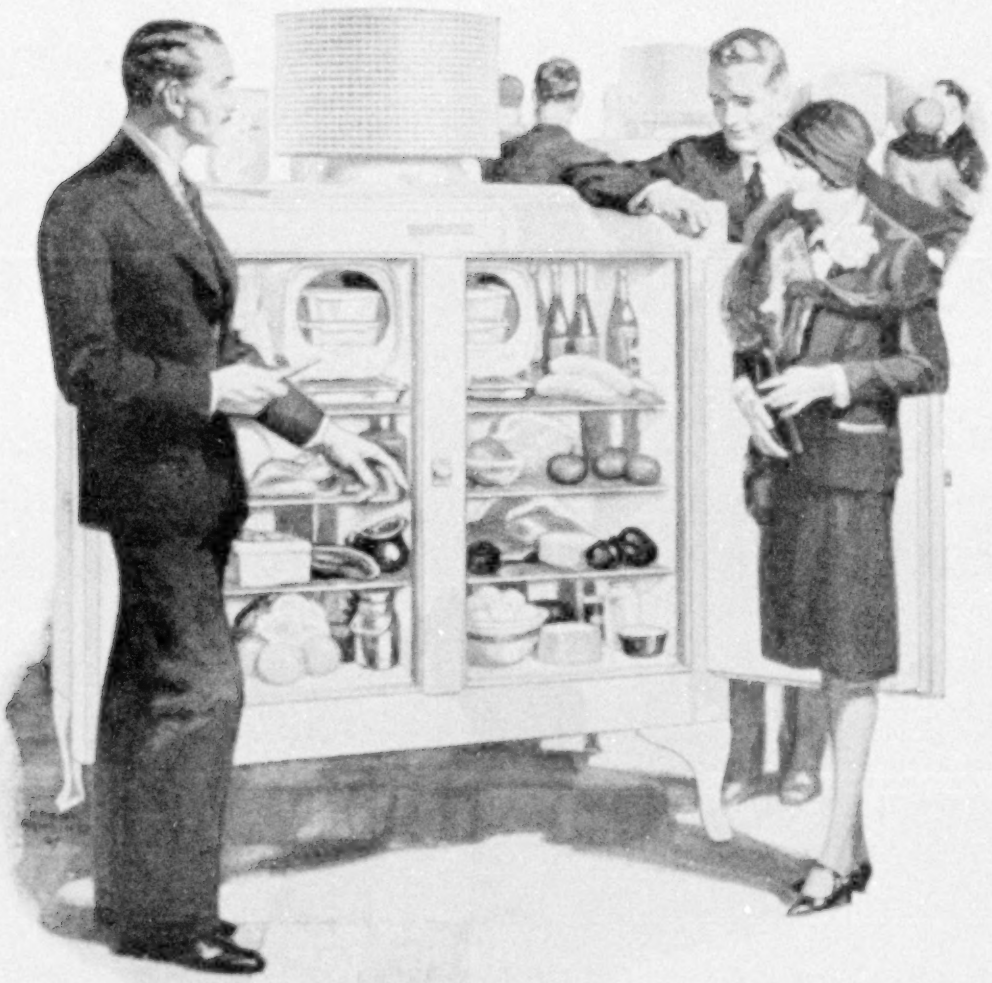
Many different makes of pianos are equipped with the Wessell, Nickel & Gross action—the world's highest-priced piano action. This famous action is found only in instruments of recognized excellence. It is your guide to a satisfactory piano purchase.

Wessell, Nickel & Gross
Established 1874 New York

When you Buy an Upright, Grand, Player or Reproducing Piano— Insist on the Wessell, Nickel & Gross Piano Action.

Judge *value* by these things

SIMPLICITY · ECONOMY · QUIETNESS · ROOMINESS



The General Electric Refrigerator is so simple that it hasn't a single exposed moving part. It hasn't a belt or a fan or a drain-pipe. It has no connections or stuffing boxes. It never needs oiling because the hermetically sealed casing which holds *all* the mechanism also holds a permanent supply of oil.

A specially designed motor of low horsepower, but high efficiency, uses very little current. Then, too, the top-unit design allows all the heat generated to rise above the box—not through it.

Standards of quietness vary so widely that we can only invite you to listen to the refrigerators to find how quietly they operate.

The remarkable compactness of the chilling chamber gives each model the very greatest shelf area for storing food.

Fifteen years of research in the General Electric laboratories have resulted in this revolutionary design.

More than fifty thousand homes already enjoy General Electric Refrigerators. The fact that they are the product of General Electric research is your *greatest* guarantee of value.

There is a wide range of models and prices. See them, study them carefully. All are shown in a completely descriptive booklet R-3 which will be sent on request.

GENERAL ELECTRIC Refrigerator

ELECTRIC REFRIGERATION DEPARTMENT · OF GENERAL ELECTRIC COMPANY · HANNA BUILDING · CLEVELAND, OHIO

Send for this fascinating book FREE!

If you are the kind of person who likes to *know* things, rather than guess, this book, "Enlightening the World," was written for you. It is the sort of book you won't be able to put down, once you start it. It contains such stimulating subjects as:

Home-making, Fashions, Foods—of Interest to Women
New Developments in the World of Science
Art—Ancient, Mediæval and Modern
The World's Music and the Advent of Radio
The School—a Mighty Educational Force
Travel and its Hundred-fold Fascinations
A Sound Background for Business and Finance
Man's Victory Over the Air
The Life About Us—Animals, Birds, Flowers, Trees
The Whole Range of Athletics and Sports
The New Psychology

"Enlightening the World" is a colorful, beautifully illustrated book of 56 pages. It is a delightful introduction to the wonders of The New International Encyclopædia—ranked by The American Library Association as the most important reference work of its kind.

$30 *Book-table Free*

This free book also gives the full details of the opportunity you now have to save $48 in the price of The New International itself, and secure *free* a handsome $30 book-table—a total saving of $78!

Your copy of "Enlightening the World" is absolutely *free*. There is no obligation on your part. Just sign the coupon and mail it.

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Mail This Coupon Now!

DODD, MEAD & COMPANY NG-3
449 Fourth Ave., New York

Send me today, free and without obligation, the 56-page book, "Enlightening the World," which tells me about the great New International Encyclopædia, the beautiful, specially designed book-table (offered free for a limited time only) and the easy terms of payment.

Name_____

Street address_____ Occupation_____

City_____ State_____

Bon Voyage ...to EUROPE

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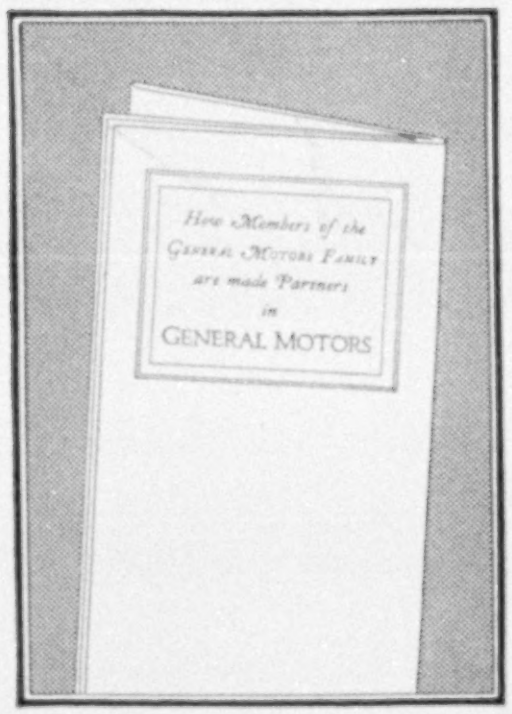
General Motors believes that employees in the plant, as well as executive officers, should have the opportunity to become stockholders, and thereby partners in the enterprise to the success of which they are contributing. Alfred P. Sloan, Jr., President of General Motors, has said on the subject:

"The prosperity that General Motors has enjoyed, naturally cannot be attributed to any single influence but on the contrary has resulted from the combined effort of many. The degree to which any institution permanently succeeds is tremendously influenced by the ability with which capital, labor and the management are co-ordinated in serving the public.... Broadly speaking, I firmly believe that General Motors in the execution of these policies has justified itself not only as an economic and efficient instrument for the production and sale of merchandise, but in its public and industrial relations as well."



In addition to its Annual Report and Quarterly Statement of Earnings, General Motors issues special booklets from time to time for the information of its stockholders, employees, dealers and the public generally. Many of the principles and policies outlined in these booklets apply to every other business as much as they do to that of General Motors.

A copy of the booklet, HOW MEMBERS OF THE GENERAL MOTORS FAMILY ARE MADE PARTNERS IN GENERAL MOTORS, together with the series of booklets to stockholders, will be mailed free upon request to Department M-2, General Motors Corporation, Broadway at 57th Street, New York, N. Y.

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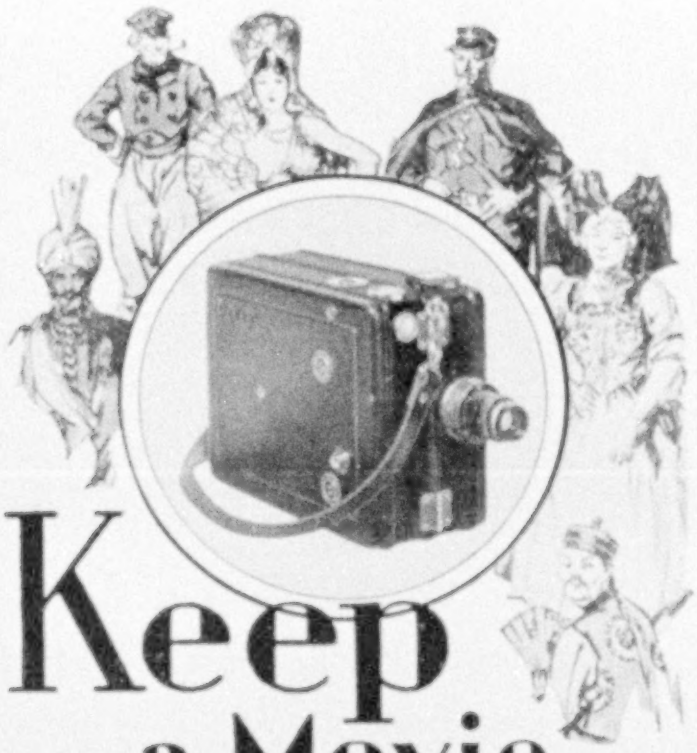

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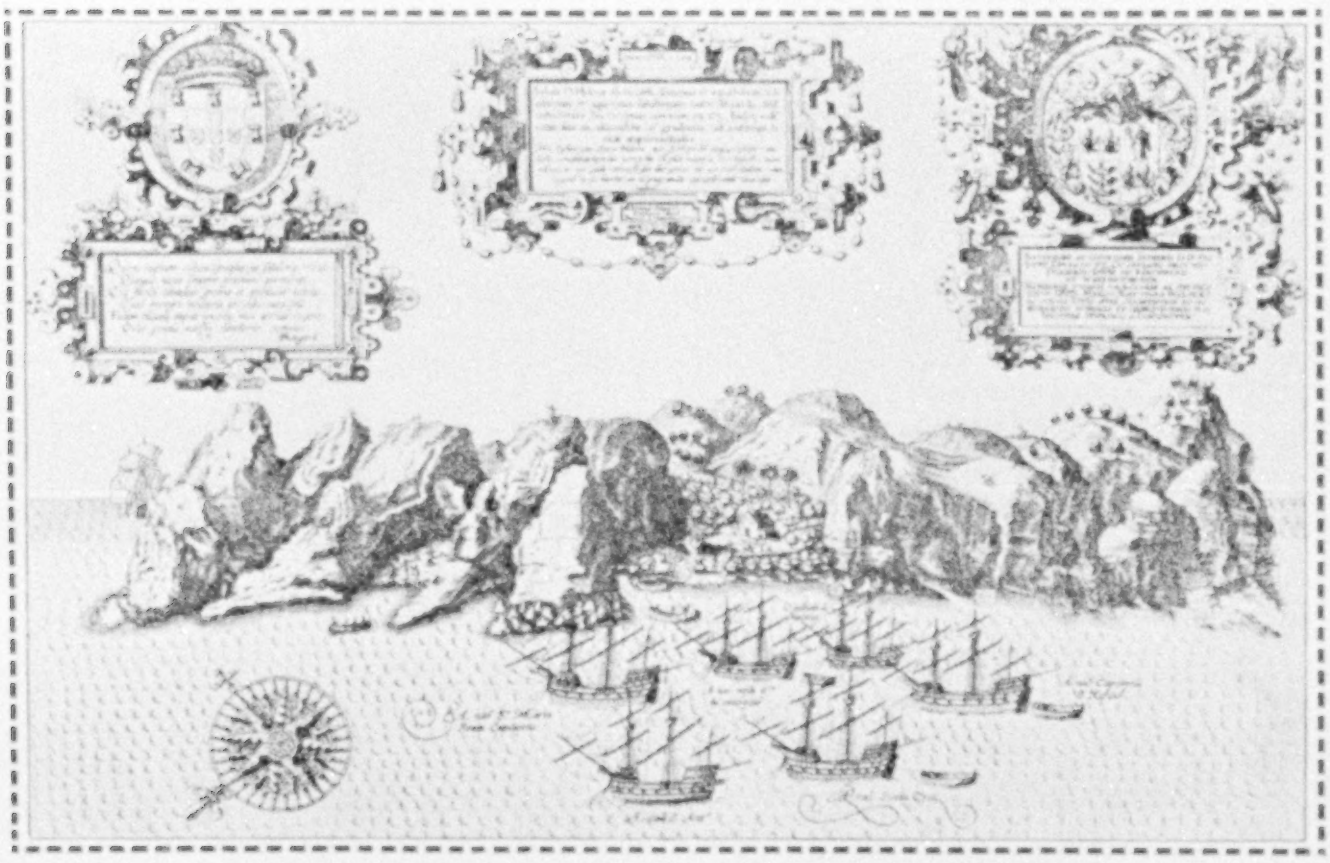
HOME MOVIE EQUIPMENT



You know its name...*Where is it?*

THE island of St. Helena! That is the place where Napoleon was imprisoned, where he spent his last years.

Yes, but where is it? How many of those who read this page can tell?

There are hundreds of places on this earth of ours whose names have an equally familiar sound but which remain little more than mere names to us.

Until, one day, thrilled with a sense of personal discovery, we suddenly run across them on the map!

Instantly they become close and real, stirring our memories with their historical or literary associations, enriching our minds by the quickening to life, the reassimilation of half-dead, half-forgotten knowledge.

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and atlases have all the charm, delight and cultural value of the world's best books.

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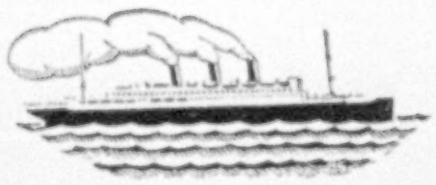

AN Englishwoman had the misfortune to lose her Oshkosh Wardrobe Trunk somewhere between England and India. Two years later it was found. Her clothes were hopelessly out of style, *but they were in perfect condition.*

An attractive descriptive booklet, "Your Home Away From Home," will be sent you on request to 413 High Street, Oshkosh, Wisconsin.

THE OSHKOSH TRUNK COMPANY
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Next summer..see this land of your dreams

UNDER balmy, invigorating, *rainless* skies—play, motor, rest and relax in Southern California next summer. Understand why artists love to paint it, poets sing it, and hard-headed business men and women linger in it to build their homes. Prepare for a glorious time and surprises that will thrill you for a lifetime! Bring your overcoat, but not your umbrella.

Here is Sportland—the playland capital of the nation. What do you enjoy best? Motoring? Golf? Swimming or surf bathing? Fishing for deep-sea fighters or upland trout? Tennis? Polo? Yachting? Motorboating? Horseback riding? Mountaineering? Camping? Dancing? *Or just plain loafing?* All are here!

Every interest point is readily accessible from Los Angeles by motor, train or trolley. Here is the Pacific Coast Metropolis—gay, interesting, thriving. Los Angeles County's natural wealth is astounding. Its oil fields are rated at a billion dollars. Last year's agricultural crop approximated $95,000,000.

Think of 271 miles of gently sloping Riviera-like beaches along the blue Pacific; the mysterious desert; giant mountains. Old Spanish Missions are irresistible, likewise fascinating Hollywood, Riverside, San Bernardino, San Diego, Ventura, Santa Barbara!

Here is the new gateway to the Orient and Hawaii. On the one trip you may include Oakland, San Francisco, Portland, Seattle, Tacoma, Spokane, at small extra cost. Consult your nearest railroad ticket agent about special low rates May 15 to October 31.

Don't think of planning next summer's trip without sending the coupon for an authentic 52-page illustrated vacation book.

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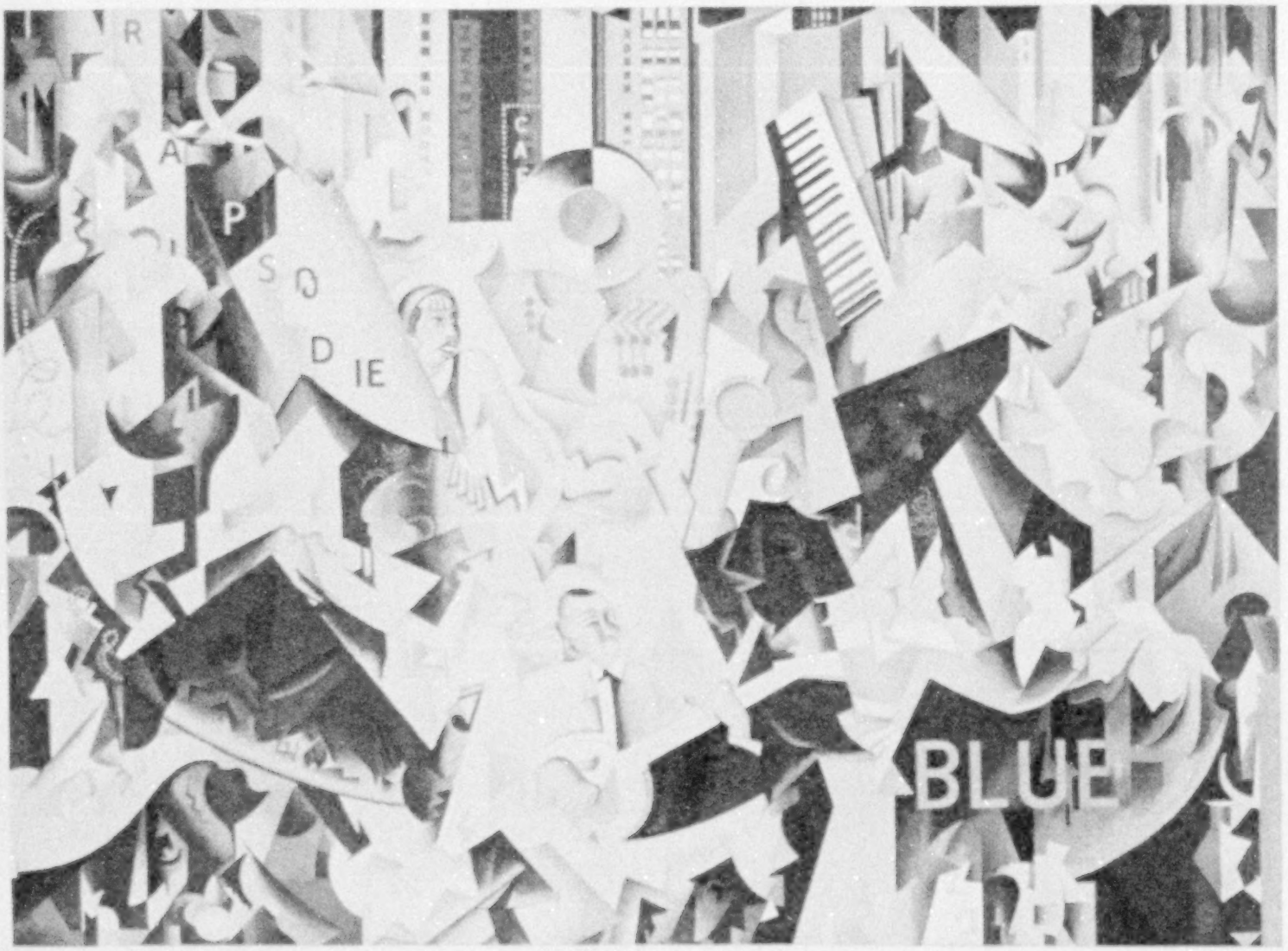
THE INSTRUMENT OF THE IMMORTALS



An interpretation of the
"Rhapsody in Blue,"
painted by Earl Horter

In any discussion of the future of American music, George Gershwin's "Rhapsody in Blue" *sooner or later becomes the center of controversy. Many believe it to be the first significant departure in the establishment of a native school of composition. Certainly it is among the most ambitious and successful of all experiments in the American idiom.*

IN THE family that values the better things of life, a piano is nothing short of a necessity. For them it is something more than a beautiful piece of furniture. It becomes a medium for gaining a more intimate sense of unity with good music.

With such people the Steinway is the inevitable choice, just as it has always been the choice of noted musicians, from the early 19th century down to George Gershwin. They respect the high tradition governing its construction . . . that history of every individual Steinway piano, which, in its five years and eleven months of unhurried growth, reflects the broader history of the firm.

It is this quality of permanence in the Steinway which places it among *the least expensive of pianos.* The years will make no difference in its playing; time will not mar the beauty of its tone. . . . For each Steinway is a musical investment. You need never buy another piano.

There is a Steinway dealer in your community, or near you, through whom you may purchase a new Steinway piano with a small cash deposit, and the balance will be extended over a period of two years. Used pianos accepted in partial exchange.

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TUBERCULOSIS can be cured more easily than any other dangerous, chronic disease. Some doctors say "arrested", others say "cured"—it amounts to the same thing. If it is detected in its early stages it can be stopped before serious damage is done.

You may have tuberculosis

Watch for these danger signs =

~ too easily tired
~ loss of weight
~ indigestion
~ cough that hangs on

Let your doctor decide

For thousands of years, tuberculosis has been mankind's great scourge. Whole families have been blotted out. Even now, when science knows exactly what causes tuberculosis, how to prevent it and how to cure it, one family in every 50 pays toll to this disease.

Young people of high school ages, and young women up to the age of 25, are especially susceptible. Tuberculosis exacts heavy penalties from men and women between 25 and 50—at the time when most needed by their families. Tuberculosis is like a fire started by a match. Stepped on immediately, the fire is stamped out completely. But if permitted to gain too much headway, it sweeps on to destruction.

In the month of March, 1928, a nation-wide campaign for the early diagnosis of tuberculosis will be conducted by more than 1500 tuberculosis and health associations of the United States. They will organize meetings where information will be given, motion pictures and posters will be shown and pamphlets distributed, all emphasizing the importance of early diagnosis.

People will be told to watch for the first signs of tuberculosis. They will be asked to answer these four questions:

1. Do you tire easily?
2. Are you losing weight?
3. Do you suffer from indigestion?
4. Have you a cough which hangs on?

There will be many instances, of course, in which people may have all four of these weaknesses without having contracted tuberculosis. But if the answer is "yes" to any one or more of these questions go to your physician for a complete medical examination. He will not merely put his ear to your partly covered chest and then give an opinion. With stethoscope on bared chest, perhaps with X-ray photographs and other diagnostic tests, he will seek to discover definitely the condition of your lungs.

Hopeful, but ill-advised sufferers have wasted millions of dollars on so-called "remedies" for tuberculosis. Not one person has ever been cured in this way. But, on the other hand, many thousands of tuberculous patients who have gone to a sanatorium and had the benefit of scientific medical care in addition to Rest, Fresh Air, Sunshine and Nourishing Food, have come back to their families—cured.

The big, life-saving message to the nation in March will be, "Find out—don't wait".

The war to prevent and cure tuberculosis is one of the brilliant triumphs of modern science. The deathrate from tuberculosis has been reduced almost two-thirds during the past 40 years.

Now statisticians boldly predict that during the lifetime of the majority of the readers of this announcement tuberculosis will be under such thorough control that it will be an infrequent cause of death.

Think what it means. Twenty years ago the principal cause of death—twenty years from now *an infrequent cause of death.*

At first the fight was a stubborn one and at times discouraging. When cases reached physicians they had usually advanced too far for successful treatment. Later, when cases were discovered in early stages the tide turned. Today—thanks to greatly increased knowledge of preventive measures and to the widespread cooperation of individuals, as well as official and private organizations, with the medical profession—tremendous gains are in sight.

The Metropolitan urges people in all parts of the country to give whole-hearted support to the March campaign of the national and local tuberculosis and health associations for early diagnosis and immediate action. A copy of the Metropolitan's booklet, "Tuberculosis", will be mailed free to every person asking for it.

HALEY FISKE, *President.*

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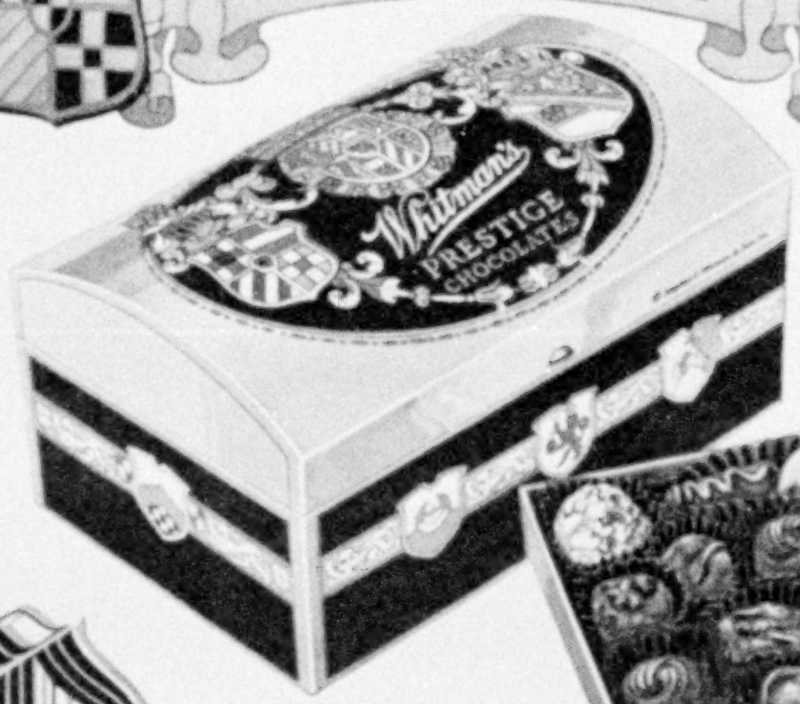

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A sincere effort to take a step forward in catering to the American taste for the finest chocolates.

Called *Prestige* because this package and its contents have behind them eighty-six years' devotion to careful making of quality candies.

Called *Prestige* because it arrives sharing the laurels and fame of such successful favorites as the *Sampler, Pleasure Island, Salmagundi, Bonnybrook*—all made and guaranteed by *Whitman's*.

We could not buy any better materials for making the Prestige assortment. Those who critically examine it will understand that the slightly higher retail price ($2 a pound) is due to the many new pieces in costly combinations and added hand labor, with the artistic and substantial nature of the metal chest. A notable gift, in one-pound or two-pound chests.

Sold by the 18,728 stores, usually the leading drug store in each locality—agents for the sale of Whitman's. Each retail store receives Whitman's Candies *direct*.

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CHOCOLATES

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1842

VOL. LIII, No. 3 WASHINGTON MARCH, 1928

THE NATIONAL GEOGRAPHIC MAGAZINE

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MICHIGAN, MISTRESS OF THE LAKES

By Melville Chater

Author of "Motor-Coaching Through North Carolina," "Dalmatian Days," "Through the Back Doors of France," "The Shores of Sunrise," etc., etc., in the National Geographic Magazine

With Illustrations from Photographs by Clifton Adams, Staff Photographer

"SO THIS is China!"

Such was the happy conviction of Monsieur Jean Nicolet as, appropriately attired in a robe of Chinese damask, he discharged his pistols over the heads of the astonished Indians on the western shores of Lake Michigan in 1634.

It is said that the Canadian town of Lachine satirically memorializes in its French name, *La Chine*, the mistake of early French explorers in assuming that the "sea people" living on a "great water," of which the Algonquins had told them, were inhabitants of the Flowery Kingdom. Nevertheless, the error brings home to one the vastness of those inland waters which Nicolet took for Chinese seas.

As he and his Indian paddlers emerged from the primeval forests of New France and gained the Great Lakes, their frail canoe was on the threshold of one of Nature's most majestic creations.

Before him lay a third of the globe's fresh-water area, stretching away in five confluent bodies lying end to end. He was surrounded by water surfaces which exceed the present aggregate areas of Belgium, the Netherlands, Denmark, Switzerland, and Portugal. Had he followed the five Lakes' outflung coasts along what was later to be called the American side, he would have canoed 3,774 miles, or about the ocean distance he had come from Old to New France.

Could the Indian guide of Monsieur Nicolet have foreseen modern mathematical computations, and had he remarked, "White man, if all the world's rivers flowed into these lakes' emptied basins, twelve moons would be needed to fill them," doubtless the Frenchman would have coughed politely and said, "*En avant!* On to China!"

THE FIRST WHITE MAN ON MICHIGAN'S TWO PENINSULAS

Furthermore, Nicolet might have noted that four of the Lakes washed the outline of two lengthy peninsulas whose tips came within six miles of touching. The first white man to tread the shores of Michigan's two peninsulas, he paused at what later Frenchmen named the Sault, or Falls, of Ste. Marie; then paddled onward for the supposed Orient.

Looking backward from to-day, when Michigan enjoys direct water communication with seven sister States and Ontario Province, with their more than 40,000,000 people — when on Michigan's northern shore the St. Marys Falls Ship Canal gives passage to the greatest lock traffic the world has ever known—one wonders if Nicolet didn't make a mistake in wanting to push on to China.

Michigan, anciently a lakeless region, owes her debt to the Glacial Period, when vast ice packs thrice advanced and thrice

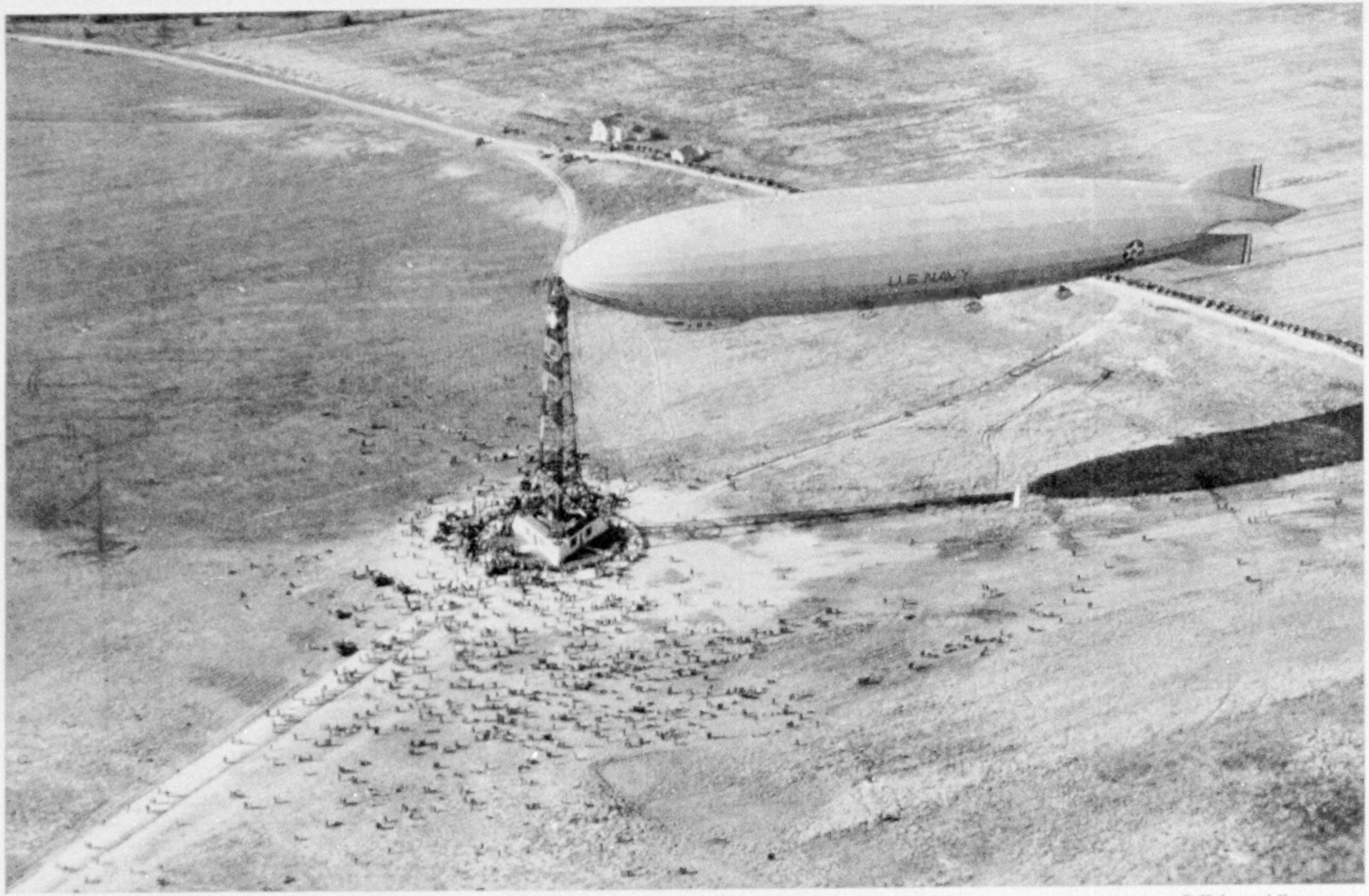
AN ALL-METAL TRI-MOTORED PLANE IN FLIGHT OVER DETROIT, CITY OF ITS MANUFACTURE

The frontier fort of two centuries ago has become one of the great cities of the world, with a population of more than one and a third millions and a diversity of industrial interests probably unsurpassed (see, also, text, page 279). In the distance, across the Detroit River, is Windsor, Ontario.

Photograph by John A. Wiederhold

DETROIT HONORS THE BIRTHPLACE OF HER NEWEST IMMORTAL

Col. Charles A. Lindbergh may be seen in the back seat of the automobile, following the dedication of a memorial tablet at his birthplace, 1120 Forest Avenue West, Detroit. The house is decorated with flags.



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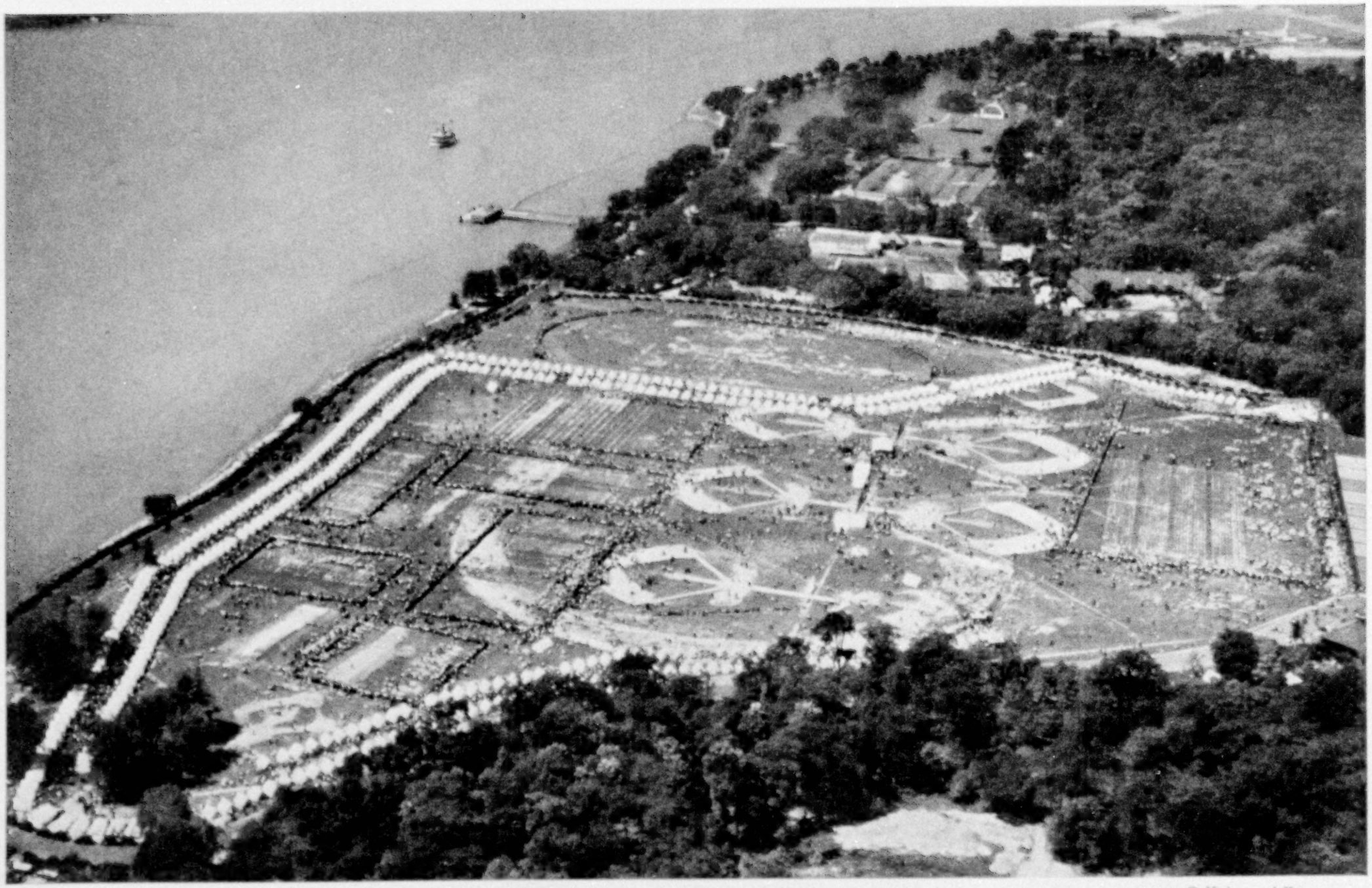
A HARBINGER OF THE COMING AËRIAL AGE

The great United States Navy dirigible *Los Angeles* is secured to a mooring mast at the Ford Airport near Detroit.

XUM



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MICHIGAN TAKES HER ATHLETICS WHOLESALE

The mammoth field meet held on the athletic grounds at Belle Isle in June, 1927, brought together 24,000 registered contestants, about 900 officials, and nearly a quarter of a million spectators. It was arranged by the Health Education Department of the Detroit public schools and sponsored by the *Detroit Free Press*. Four hundred tents were pitched around the field to provide headquarters for the contesting teams (see, also, text, page 286).

Drawn by A. H. Bumstead

THE WESTERN HALF OF MICHIGAN'S UPPER PENINSULA

Following the dispute of 1835-37, the Wolverine State with reluctance relinquished her claim on the so-called "Toledo Strip," embracing an area of less than 500 square miles, in exchange for the entire Upper Peninsula, with an area twice as large as the State of Massachusetts. At the time of its transfer this wilderness was considered practically worthless; but, like "Seward's Folly" (Alaska), it has proved a veritable bonanza of mineral wealth (see text, page 310).

retreated over her river basins and valleys, carving and deepening these into Titanic gullies; for upon the melting back of the third so-called "Wisconsin" drift the parent bodies of the Great Lakes appeared.

TWO-FIFTHS OF MICHIGAN'S SURFACE IS WATER

In giving Michigan a coast line of 1,750 miles, the Great Lakes have endowed her with a unique individuality.

Having regard to her more than 5,000 inland lakes and such exterior lake areas as lie within her boundaries, the State's surface is more than two-fifths water.

Her very name echoes Indian syllables referring to water. "Mich-sawg-ye-gan" means "the lake country." The Indian name for the "Big Sea-Water" is familiar to every reader of "Hiawatha," and possibly Lake Michigamme, in the Upper Peninsula, offers in its name some phonetic link between "Gitche Gumee" and "Michigan."

Drawn by A. H. Bumstead

A MAP OF MICHIGAN'S LOWER PENINSULA AND THE EASTERN HALF OF THE UPPER PENINSULA

Photograph by John A. Wiederhold

"SHEBA" TAKES HER OWNERS FOR A RIDE ON BELLE ISLE

When the children of Detroit decided they wanted an elephant, they saved up their pennies and bought one. Popular ballot gave the pet her name.

Were her people romantically inclined, they might quite reasonably imitate the old Venetian doges by dropping rings overboard and "wedding" Michigan to the Great Lakes.

A NOTABLE LIST OF EXPLORERS HEADED BY LA SALLE

For seventy-odd years following Nicolet's exploration, Jesuit missionaries canoed the Great Lakes, preached, and suffered unto martyrdom.

Establishing their bases in Michigan's strait region, they inhabited the bark-covered lodges of the Ojibways, Ottawas, and Potawatamis, smoked their pipes, recorded their legends. From the forest wilderness they addressed the civilization they had renounced, now requesting lively pictures of hell, now urging that the Church's salvation and the fur traders' brandy selling should not go hand in hand.

The Jesuits' long list opens with Fathers Jogues and Raymbault. It includes Father Marquette, who, with Louis Joliet, descended the Mississippi. It ends with Fathers Carheil and Marest. When the last-named burned their chapels at Mackinac and quitted the region, there closed a régime which, offering itself as a shock absorber for later explorers, had left deathless examples of patience and heroism.

Midway in the Jesuit period towers the great name of Robert de la Salle. His part in winning the unknown West forever stamps the Lakes region with associations of this high dreamer and doer, the "captain of his soul." La Salle achieved his ambition of discovering the Mississippi's mouth, and later, while leading an ill-fated colonizing expedition, was murdered by his own men.

JESUITS PUBLISHED EARLY MAP OF LAKES REGION

It was the early Jesuits who published one of the first maps of the Lakes region. It was some much-later geographer who has stirred the imagination of millions of school children by announcing that Michigan's Lower Peninsula is mitten-shaped, and that her Upper Peninsula resembles an arrow set on a bow.

Symbols suggesting snows, loggers, trappers, and Indians convey sharp profiles of the State's pioneer era. But it occurs to the present-day visitor, who finds Michi-

Photograph courtesy the *Detroit News*

ON ONE OF THE ICE-COVERED LAGOONS OF BELLE ISLE, DETROIT

Photograph by John A. Wiederhold

HUNGARIAN DANCERS IN A STRANGE SETTING

The rapid industrial development of the city of Detroit has drawn to it immigrants of various nationalities. Although their coming has created many municipal problems, they have provided a colorful note against the drab background of giant industry. These Hungarians, in native costumes of red, white, and green, are enjoying the *csárdás*, a dance of their homeland.

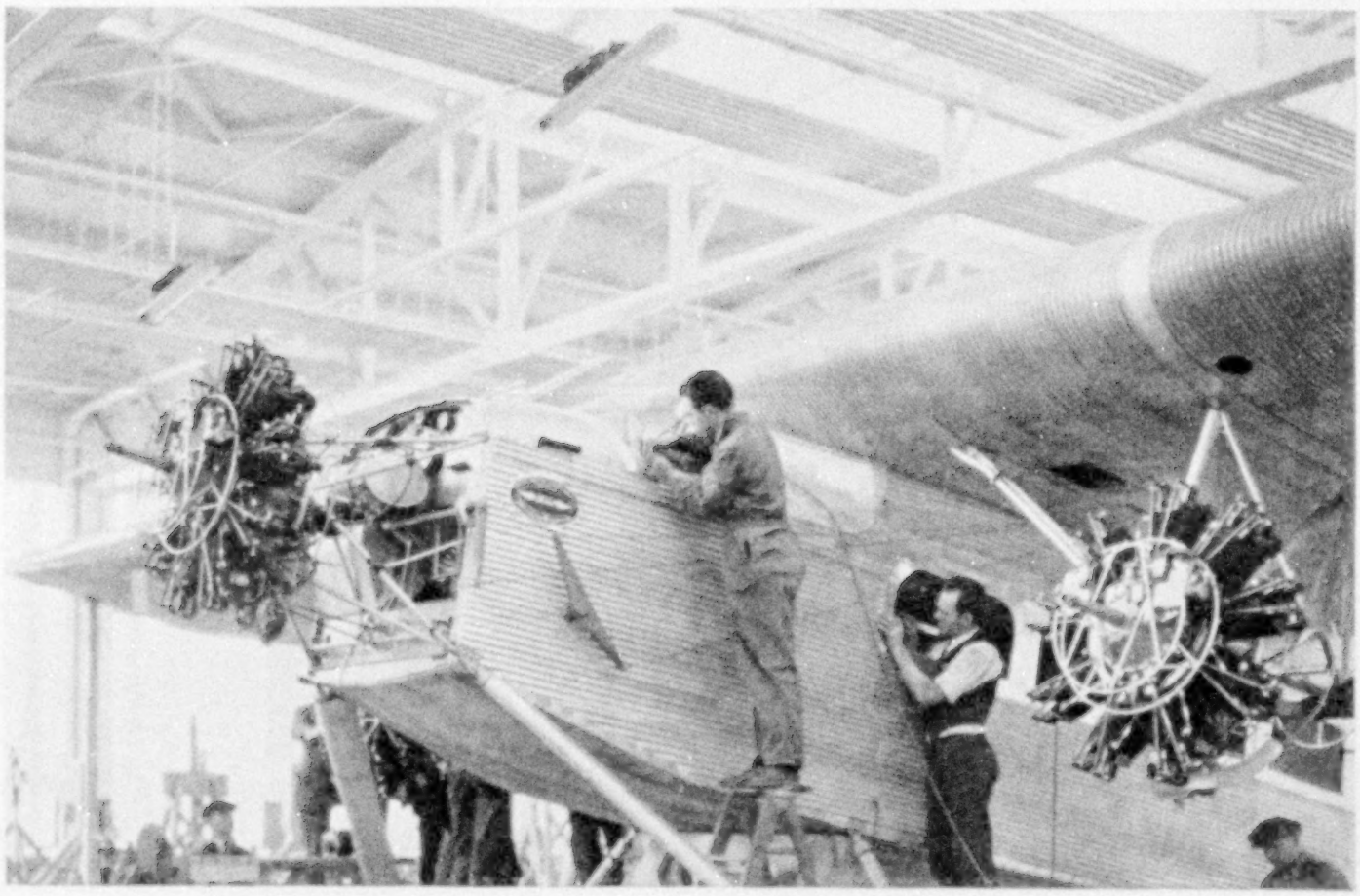
A BEAUTIFUL PARK LIES AT THE HEART OF MICHIGAN'S METROPOLIS

Grand Circus Park is a maple- and elm-shaded area almost in the center of the business district of Detroit, with many theaters, office buildings, and hotels grouped about it. The streets converging here are Woodward and Washington avenues.

Photograph courtesy the *Detroit News*

AMONG THE FASTEST THINGS AFLOAT

Speed lovers have not confined their activities to the air and the open road. They have invaded Neptune's realm as well, and some of their power boats develop a speed of more than a mile a minute. Detroit has played a conspicuous rôle in the development of fast motor boats.



THE CITY OF AUTOMOBILES IS TAKING TO THE AIR

Airplane manufacture is assuming a prominent place in Detroit. This type of all-metal plane, equipped with three motors of 200 horsepower each, is used by various air transportation companies to carry mail, freight, and passengers.

gan's log jams a memory, her few Indians undiscernible among an estimated population of four and a half million, her forests largely replaced by farms, her early industries obliterated by factory systems, that the State needs a new symbol, something which conveys her emergence as an industrial power.

Applying Michigan's actual dimensions to the two familiar symbols would add a couple of Gargantuan tales to those told in logging camps about Paul Bunyan, the lumberjacks' mythical hero. The "mitten," which by motorcar travel measures more than 1,000 miles in circumference, would just about suit Paul's wife, Carrie, who used "thirteen Hudson Bay blankets and the sails of a full-rigged ship to make her a waist and skirt."

As for the "bow-and-arrow," the circling of which adds 800 more miles to your speedometer, Paul would certainly have given it to Teeny, his gigantic youngster, as a toy. And if Teeny had ever inquired, "Pa, how did Michigan get bust off into two pieces?" Paul would probably have explained, "Log jams was so big in them days that I had to kick a hole through it so as to get them from Lake Michigan into Lake Huron."

A KING'S HAT GAVE DETROIT ITS START

Immediately after the Jesuit régime Detroit steps into the historical picture. Oddly, it owes its original settlement to the hat of a king of France.

One day Louis XII ostracized the prevalent velvet cap by appearing in a queer, lofty-crowned affair of beaver fur. Because other fashion-setting monarchs imitated him and because the beaver supply, though limited in Europe, was plentiful in New France, Indians were soon paddling their canoes 500 miles to Michilimackinac to trade their furs for French brandy.

But the British, who had also succumbed to the beaver-hat craze, began coming from Fort Orange (Albany, New York) up Lake Erie to the future Detroit region, which was then known as the Beaver Country. These "perfidious" British, who distilled a rum cheaper than French brandy and with an equal "kick," doubled

CATBOATS RACING ON LAKE ST. CLAIR

Photographs courtesy the *Detroit News*

FEW SPORTS OFFER A GREATER THRILL THAN SAILING ON THE ICE

A fleet of winter pleasure craft ready for a race over the smooth ice of Lake St. Clair.

Photograph courtesy the *Detroit News*

FAIR DEVOTEES OF ICE BOATING

their firewater allowances in bartering for peltries!

The Indian trappers forsook Michilimackinac. In commercial parlance, the fur trade became "diverted" to Detroit.

"THE BIG VILLAGE" GROWS DESPITE FIRE AND SWORD

Hence it was that in 1701 Antoine de la Mothe Cadillac, sometime commandant at Mackinac Island, came from Montreal with 25 canoes loaded with soldiers and *voyageurs* to build a lake-barring stockade, known as Fort Pontchartrain, on the *détroit* (strait) which ultimately gave Detroit its name.

But the whole vast region of New France was destined, as a result of the French and Indian War (1754-1763), to become a British province. Lacking agricultural development, France's century-long régime in the Lakes region had achieved no more than the establishment of trading-posts at the Sault, Michilimackinac and Detroit.

In 1763 Detroit escaped massacre by a hairbreadth and withstood a six months' siege. This was a part of the federated Indian tribes' simultaneous but unsuccessful attack on all British posts west of the Alleghenies.

Her next escape was when the Spanish, overstretching their conception of what Florida included, unsuccessfully invaded south Michigan in 1780-81.

When the future State was finally surrendered by the British in 1796, nobody attached undue importance to a village named Detroit, with its 500 inhabitants and its area of less than a square mile.

Skip 132 years and Detroit reappears as the Nation's fourth largest city, with an area of more than 140 square miles, a population of 1,334,000, and an industrial-products value of $2,000,000,000 a year. Yes, Detroit has handsomely realized her old Indian appellation of Yondotega, meaning "the big village."

Approaching the city by lake steamer, one beholds a striking panorama. The Canadian side shows many miles of green meadow, while the American side reveals a gradually intensifying spectacle of mammoth cranes, towering stacks, vast fac-

THE CAPITOL BUILDING AT LANSING, ONE OF SEVERAL TO STAND ON THIS SITE

At the time that it was laid out for the State capital, only one family was living in Lansing; to-day it is one of the leading industrial centers of Michigan (see, also, pages 290-294).

tories—all of industry's bewildering panoply.

A CITY WITHOUT SLUMS

Detroit's industries employ some 350,000 workers, who are massed in units attaining to 55,000 or 65,000 in a single establishment. It is, of course, her automotive industry, which predominates in this mass employment.

Yet, notwithstanding so large an industrial population, Detroit may fairly be described as a slumless city. One hint of its workers' well-being is found in local savings-banks deposits, which totaled $408,000,000 in 1927. Moreover, the scores of superintendents' motorcars which were parked around automobile factories ten or fifteen years ago have since swelled into the thousands upon thousands owned by the factory hands themselves. The famous taxicab army of the Marne has nothing on the spectacle of Detroit's industrial armies motoring to work. It is a striking instance of percolated prosperity.

Lest the motorcar bulk disproportionately on Detroit's skyline, it should be remembered that the city's 3,000 major manufacturing plants include 35 lines that fall into the million-dollars-a-year class of productivity.

In fact, ever since the days when Detroit made the first gold pens, ran the first refrigerator cars, and built among the earliest of sleeping cars—and, tradition adds, mixed the first ice-cream soda—the Michigan metropolis has been a plexus of diversified manufacturing.

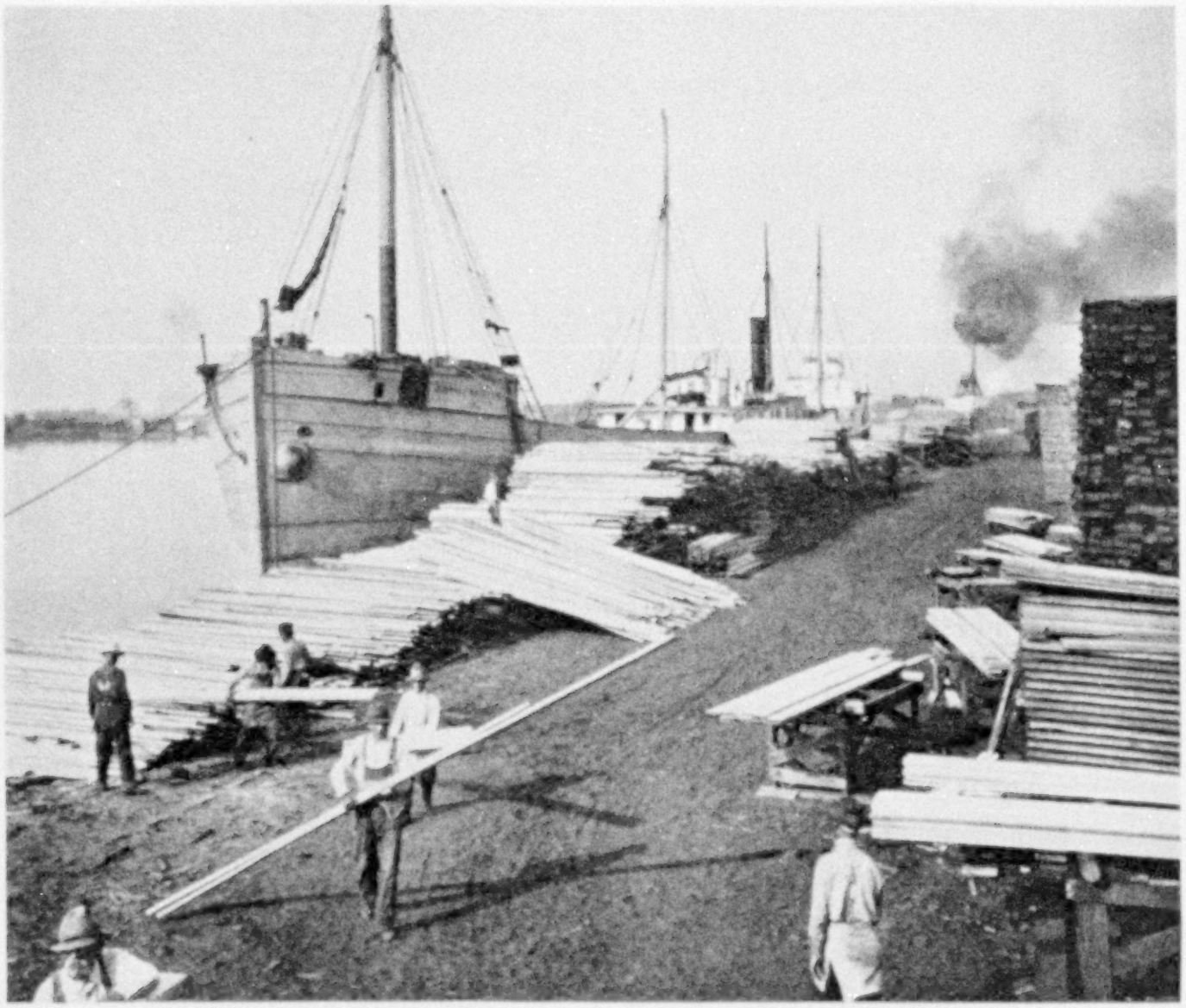
THE LUMBERJACK'S DINNER HORN

At noon the assistant cook retires to the rear of the cook shack and sounds the call.

THE FAVORITE INDOOR SPORT OF MICHIGAN LUMBER CAMPS

A unique feature of some of the camps is the absolute silence maintained at meals. This rule very effectively prevents arguments, which might lead to brawls, broken dishes, and broken heads. A lumberjack's appetite is proverbially good and the camps furnish plentiful quantities of wholesome food.

XUM



IN YEARS GONE BY SAGINAW WAS A CENTER FOR MANUFACTURED LUMBER PRODUCTS

A vessel has just discharged a cargo of a million board feet of rough lumber from a Canadian port, which one of Saginaw's few remaining mills will finish for ready-cut houses (p. 295).

Her growth, measured in terms of population, has increased more than 360 per cent during this century. Indeed, her present roll of industrial operatives surpasses by more than 60,000 her total population of 1900.

Measured by her usage of electric light and power, she has grown forty-fold in twenty years.

REBUILDING DETROIT'S SKYLINE

Such growth plays hob with exclusive neighborhoods. Jefferson Avenue has become metamorphosed with garages and apartments. Woodward Avenue, with many a fine old mansion's front yard now hedged between automobile salesrooms and doing duty as a public parking space, has recharacterized itself as Gasoline Row (see page 278).

Notably within the past ten years the office cloud-toucher has taken its place in Detroit's skyline, and apartment hotels and hotel skyscrapers cannot be reared fast enough to keep pace with her growth. In fact, Detroit's rapid changes in physiognomy justify the English writer who remarked of American cities, "Wrecked buildings spring up like mushrooms."

Everywhere the traffic problem is seen in an endless procession of motorcars and in parking spaces, where these cars are ranged as thickly as peas in a pod.

Commuting by your own car, whether from the boulevards or from the beautiful suburbs of Grosse Pointe, Indian Village, Bloomfield Hills, and Oakland Hills, is no joyride; for Wayne County's automotive registrations total 396,000, and twice daily comes the big traffic jam, caused by a large proportion of those cars reaching or leaving Detroit's industrial

Photograph by Benjamin Wallace Douglass

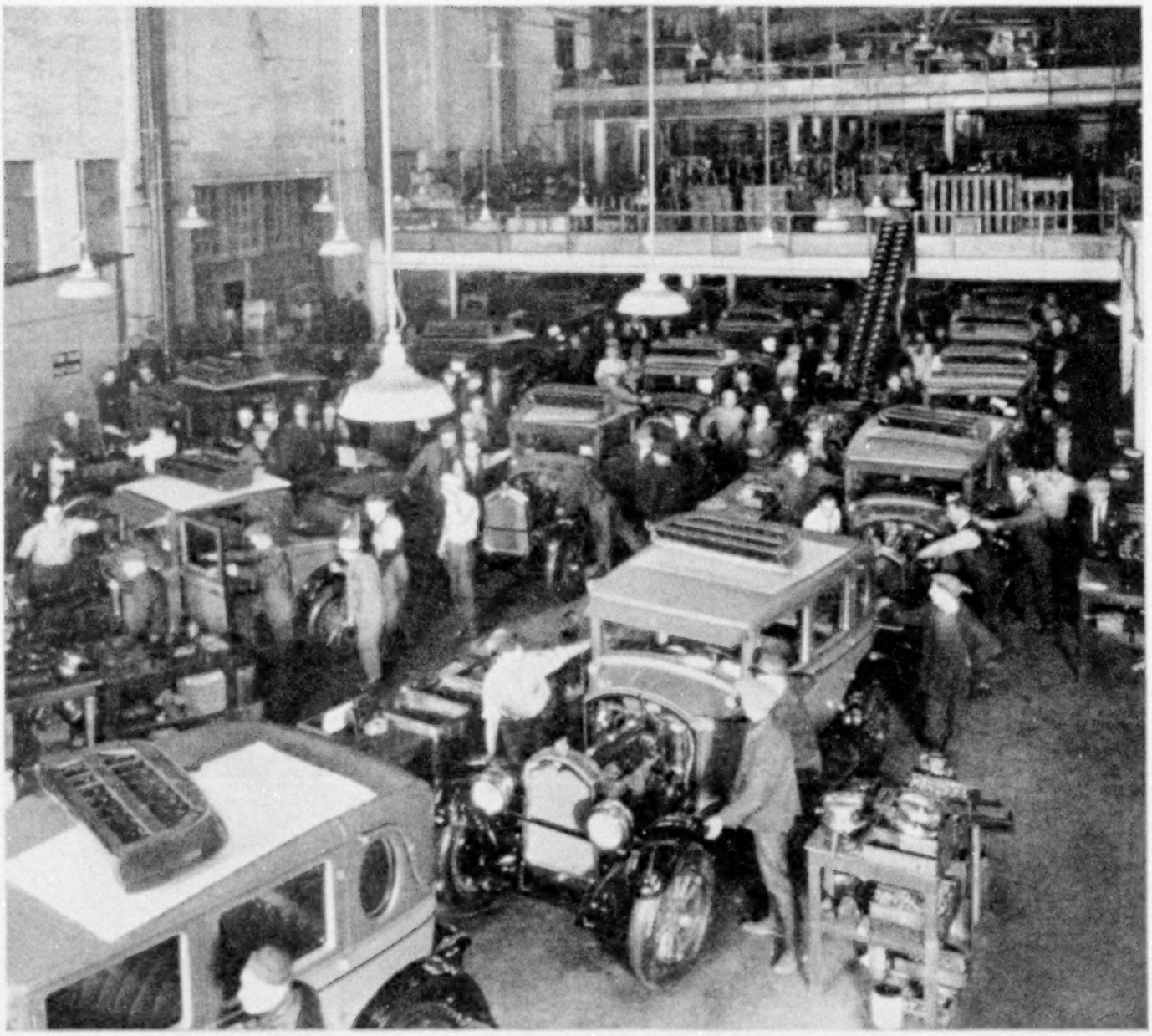
LOGS ON THEIR WAY TO BECOME PAPER

Timber was one of the first sources of Michigan's prosperity, and many a town in the twin peninsulas grew up around a sawmill. There are still great timber resources in the State, and it is no uncommon sight to see huge rafts of pulpwood logs being floated downstream for the consumption of paper mills (see page 293).

Photograph courtesy the *Detroit News*

THE HORSE HAS NOT BEEN ENTIRELY DISPLACED, EVEN IN THE AUTOMOBILE STATE

In the lumber camps there are certain kinds of work that can be done better by horses than by motors, and the strong and faithful animals are still to be found on the job.



AT THE END OF THE LONG PRODUCTION TRAIL

Radiator caps and hoods are the last things to be put on the cars at the end of the unified assembly line of this great automobile plant in Michigan (see text, page 299). Then gas and oil are put in the tanks and each car is tested before being shipped or driven away.

plants or its office section of about one square mile.

Southey's jazz poem of "How the waters come down at Lodore" might well he readapted to describe "How the flivvers come into Detroit."

DETROIT'S ENCHANTED ISLAND

One turns gratefully from Detroit's traffic-choked thoroughfares into that loveliest retreat of all her 3,000 acres of park space—Belle Isle (see illustrations, pages 273, 276, and 277).

In trading 8 barrels of rum, 3 rolls of tobacco, and 6 pounds of warpaint for the Indian-owned Belle Isle, the city's forefathers achieved something not to be expressed by its present valuation of many millions of dollars; for Belle Isle Park is at once the worker's restful Avalon, treasure-hunting childhood's pirate lair, and everyone's Enchanted Island, with songbirds as Ariels and caged bears as Calibans. What more intriguing than a wooded island park, canalized for canoeing, dotted with picnickers' stoves, and visited by a symphony orchestra—this on the edge of a great industrial city?

On a fine spring day as many as 246,000 automobiles, containing representatives of Detroit's 40 nationalities, have visited Belle Isle Park.

Detroit was the State's first capital, and not until 1848 did Lansing assume that dignity. Meanwhile much water had flowed under history's bridges.

Photograph from General Motors

TESTING AUTOMOBILES AT SPEEDS UP TO 125 MILES AN HOUR

The east end of a high-speed track in a 1,250-acre proving ground at Milford, near Pontiac. Here several different makes of automobiles and trucks are tested for speed, power, acceleration, hill climbing, steering effort, gasoline and oil consumption.

The Northwest Territory had been created in 1787, and out of this the subterritory of Michigan had been carved in 1805. The War of 1812, with its opening campaign on Michigan's soil, had come and gone. The public land sale of 1818 had tempted settlers to Michigan's remote wilderness. In 1825 "Clinton's ditch," the Erie Canal, had established water connection between the Great Lakes and the Hudson. In 1837 Michigan, with 174,000 people, had become the twenty-sixth State of the Union. And finally there had befallen, between 1836 and 1844, her boom period of land speculation, wildcat banking, and railroad building.

WILDCAT BANKING WAS BORN IN MICHIGAN

With public lands acquirable at $1.25 an acre, one needed only an impressively elaborate map and the gift of imagination to sell "town sites" which were destined never to exist beyond the domain of eloquence. Water power and sawmills figured largely in the sales talk, but subsequent realization too often resembled the experience of one investigating agent who wrote his distant client: "I found the location; also a dam by a millsite, but no mill by a damsite."

The term "wildcat banking" refers to the sumptuous paper money, stamped with wildcats or dashing steeds, which flooded Michigan as a result of a general law permitting any ten or more freeholders to form a banking concern.

The State was soon dotted with mushroom banks, and the too trustful pioneer's cash was "on deposit" in anything from a cellar to a sawmill. Each bank's actual specie being in inverse ratio to its issued paper, a traveling reserve fund was adroitly spirited from town to town in time to meet the visiting examiner's eye.

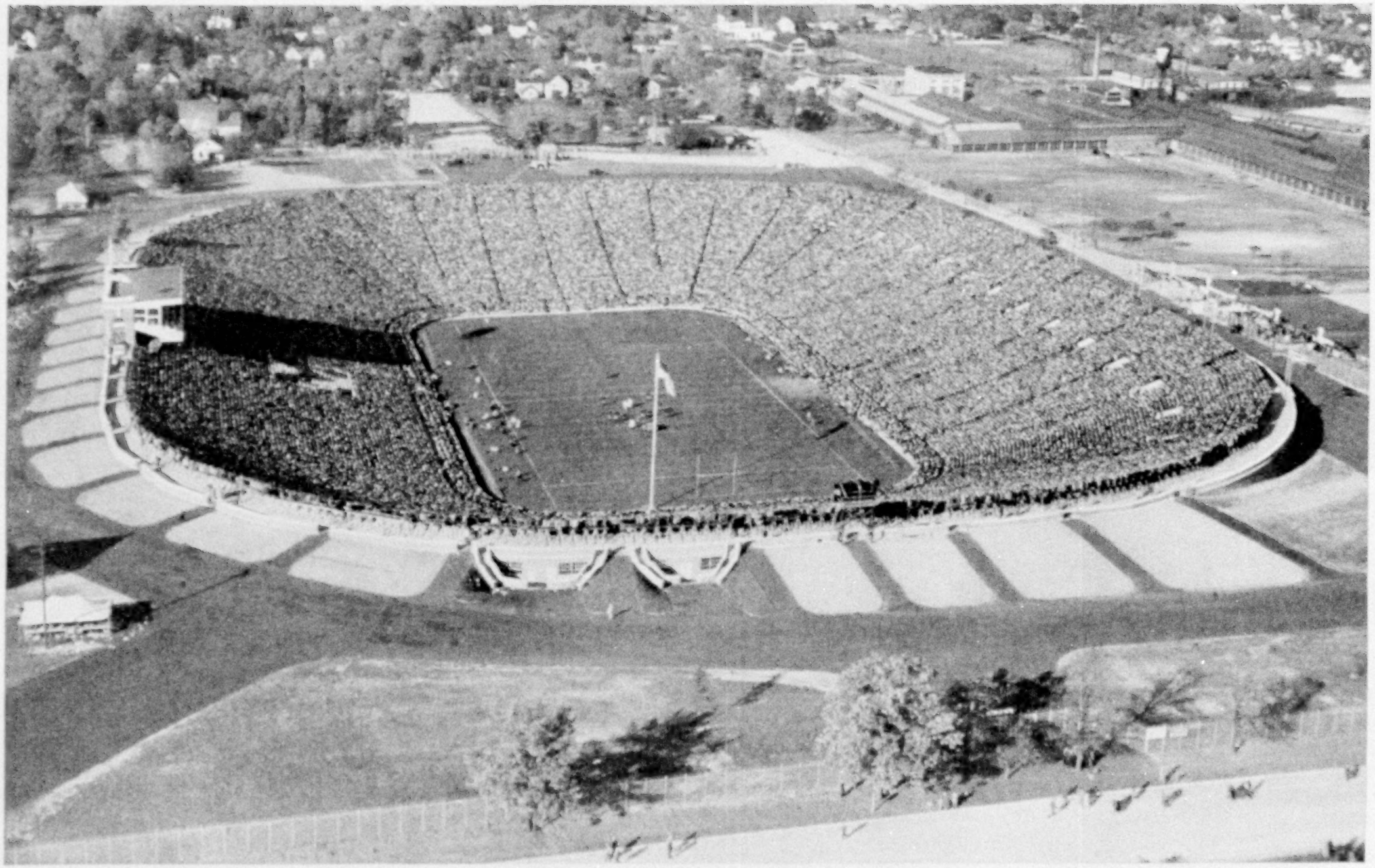
WHEN RAILROAD TRACKS FIRED ON PASSENGERS

With the abrogation of this law in 1844, many a magnificently entitled but fly-by-night concern—the "Bank of Singapore" among them—faded out, leaving a de-

XUM

ONE OF AMERICA'S GREAT SEATS OF LEARNING

Angell Hall is among the largest buildings on the campus of the University of Michigan, at Ann Arbor. It is used for literature and science classrooms and for the administration offices. Michigan has played a conspicuous part in the progress of American education (see text, page 299).



© Kalec and Forster

THOUSANDS ASSEMBLE IN ANN ARBOR'S STADIUM TO SEE MICHIGAN'S GRIDMEN DEFEND THEIR TITLE

Approximately 86,000 people fill every available foot of space whenever the Wolverine State's university team goes into action against a major rival.

MUCH OF THE WORLD'S PEPPERMINT COMES FROM MICHIGAN

Its chief uses are for flavoring dental preparations, confections, and chewing gum. This peppermint farm covers 2,200 acres.

serted village. And the hardware fraternity received back many a keg of nails which had done duty as a specie reserve.

Pontiac, a town founded in the early boom period, leaped into the general expansion frenzy by taking out the State's first railroad charter in 1830. Six years later work was begun on the Detroit & Pontiac Railroad. Presently many a pioneer, upon hearing the first locomotive's distant shriek, was seizing his gun to "git the b'ar" with the strident voice.

The original track of wooden, iron-sheathed rails was soon discharging ripped-off fragments of sheathing through the car bottoms. These "snake-heads," as the flying fragments were called, caused many a casualty among the passengers until the D. & P. came handsomely to the rescue with "a new and elegant car" whose metaled flooring smothered the snake-head offensive.

Michigan's through-rail connection with the East was established by the completion of the Great Western Railroad in 1854.

TO-DAY IS MICHIGAN'S MANUFACTURING ERA

Nowadays the State's transportation is served by steam lines operating 8,700 miles, motor coaches 7,000 miles, and electric lines 1,090 miles.

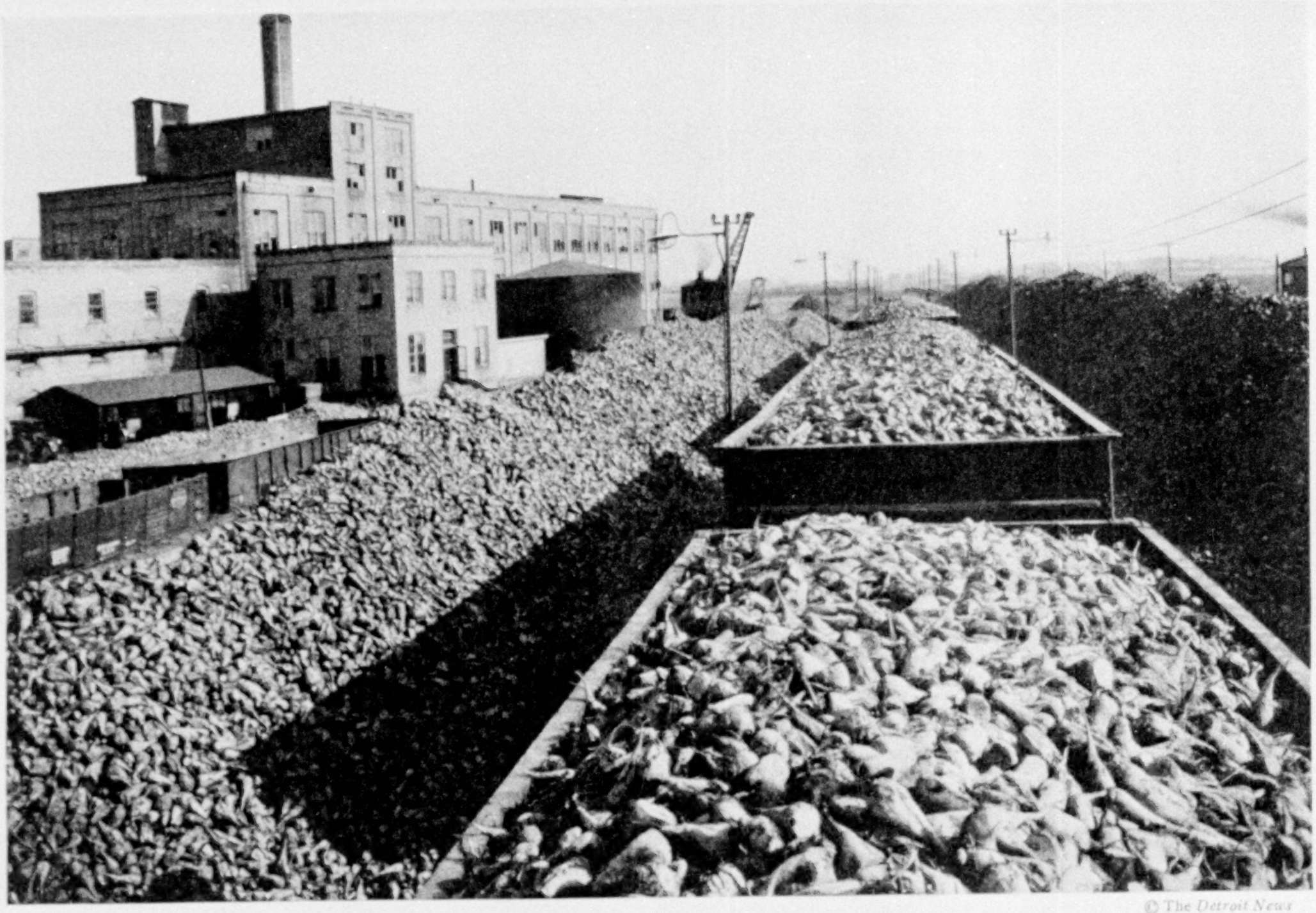
When the State's second capital, named

THE FARMING REGION ABOUT KALAMAZOO AND MANTON IS NOTED FOR CELERY

The soil is a deep black muck and the plants grow in long, boarded-in rows. Tourists in the vicinity of Kalamazoo are familiar with the sight of great cartloads of celery being sold on the street corners (see, also, text, page 300).

IN THE STORAGE BINS OF ONE OF THE SAGINAW SUGAR FACTORIES

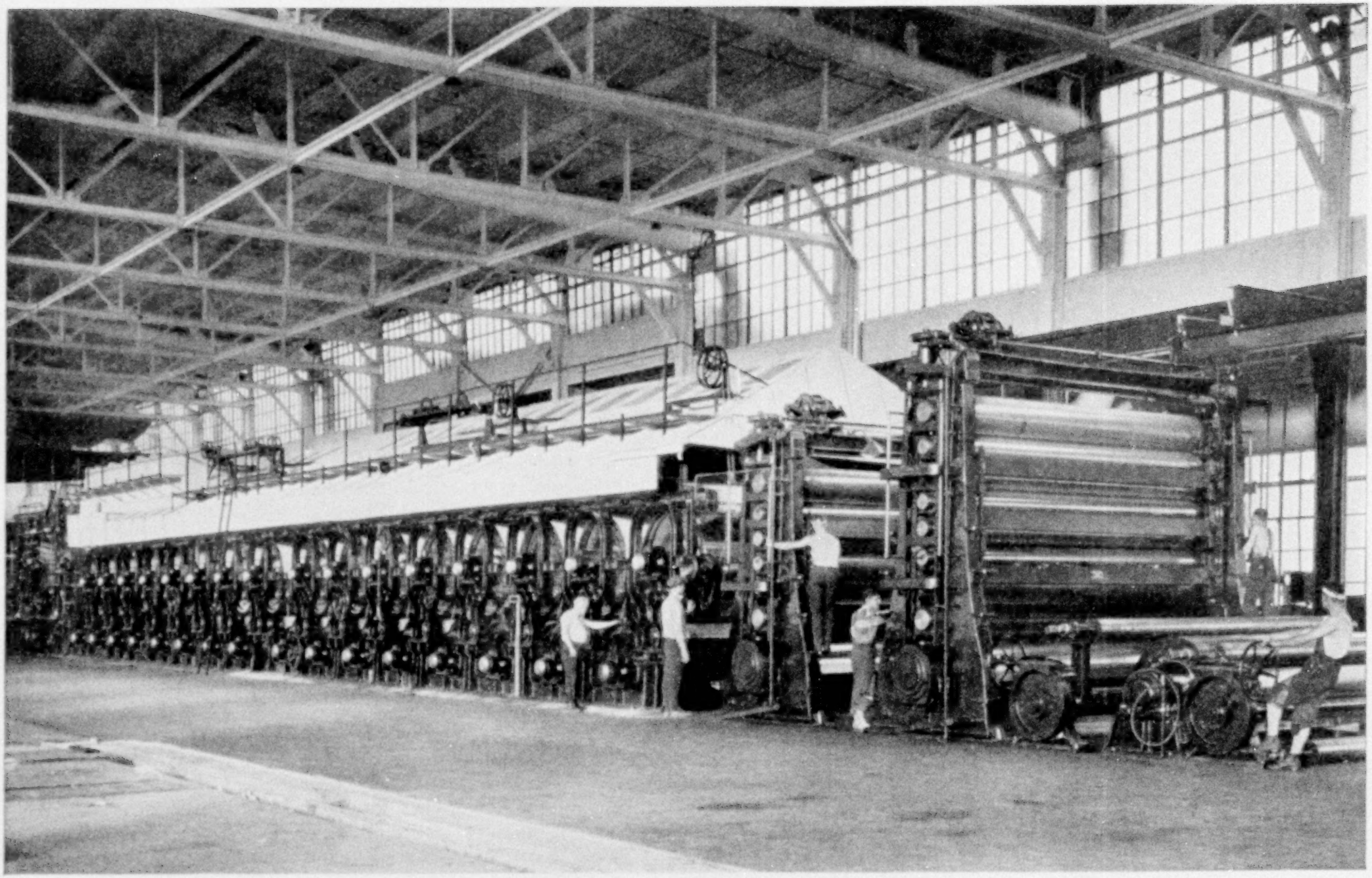
The beets are loaded into the bins from motor trucks and freight cars, and are conveyed to the slicers and cookers within the plant by water flowing swiftly through sluiceways.



© The *Detroit News*

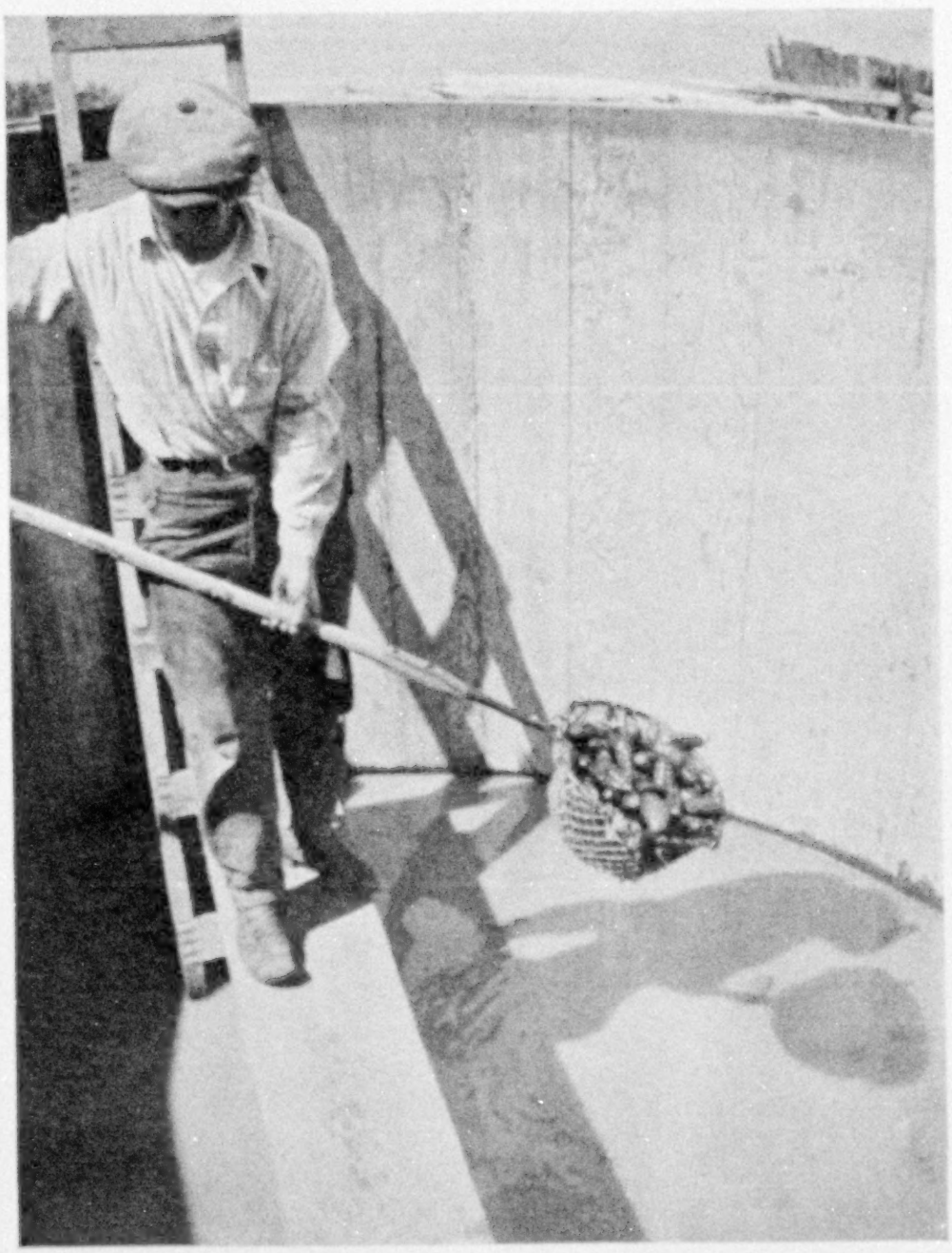
RAW MATERIAL FOR THE SATISFACTION OF AMERICA'S BIG SWEET TOOTH

Michigan stands with Colorado in the front rank of States producing sugar beets. Her crop approximates a million tons annually, but this figure shrinks to little more than an eighth of its weight by the time the beets are reduced to refined sugar.



IN FIVE MINUTES THIS PLANT CAN TURN OUT A MILE OF PAPER

The Kalamazoo Valley is among the most extensive paper manufacturing centers of the world. This is one of its largest units and embodies the most advanced ideas in paper-making machinery (see, also, text, page 300).



Photograph by Felix J. Koch

PICKLES IN THE MAKING

Near Onekama is one of the largest pickle districts in the world.

for John Lansing, patriot and jurist, was established in 1848, the legislature found itself in a huge, barnlike structure whose timbers had been hewn in the surrounding forest wilderness. So few were the white settlers thereabout that Indians were enlisted to raise the liberty pole.

But to-day is Michigan's manufacturing era. Her every city, it seems, must make something, and her very capital is not content to make only laws. Lansing has 15,000 hands engaged in industries, mainly the automotive or auxiliary thereto, producing an annual output valued at $185,000,000.

Though Lansing's forests have long since yielded to the spacious avenues radiating from her lawn-surrounded Statehouse, and though the cry for reforesting the State is widespread, the capital and her sister cities rank among the country's most beautifully tree-shaded communities. Sometimes appearing as if buried in greenery, and for the most part displaying regularly spaced maples along foliage-roofed streets, Michigan's towns thus preserve a souvenir of the great logging area of their State.

Michigan's "forest primeval" lay with pine and softwoods mainly to the north of the 43d parallel of latitude, and with the hardwoods mainly to the south of it. A century ago her area was still 97 per cent timbered.

WHEN THE LUMBERJACK WAS KING

In the expansion period that followed the Civil War the State loomed up as the great pine producer. Eastern farmers turned pioneer and trekked Michiganward for their fractional investment in the 125,000,000,000 feet of timber that rose north of Saginaw. The Prairie States were calling for timber, and Michigan's was massed in big stands with easy river access to the Great Lakes.

Up sprang 800 camps employing 25,000 loggers. Plank roads were laid through the wilderness. In 1875 there were 30 solid miles of logs in the Au Gres. For more than 30 years men chopped and saws screamed, until in 1890 Michigan's pine lumbering reached its peak with 4,250,000,000 feet.

Few indeed are the survivors who can

Photograph by Felix J. Koch

TUNS OF PICKLES

In these huge containers which line a central walk the pickles are set in brine, and as a given lot is desired an attendant with a net dips up the required quantity (see opposite page).

spin tales of tremendous log drives down some spring-swollen river in the sixties. "Great days those," says one octogenarian, "with our drive of 1,400,000 feet of pine logs ready for the ice break-up, and the boss's wife—our cook and the only woman in camp—and the boys eating, drinking, fighting, swearing, and snoring—all in French-Canuck!"

Few remember Silver Jack, the toughest, "swearingest" character in the drive of eighty, and how he wouldn't have his mother's religion insulted by the college graduate who questioned the Savior's divinity, and how Jack fairly throttled him into acknowledging the same; whereupon the whiskey bottle was passed and the camp solemnly drank to Jack's mother's religion.

GROWING PAINS ACCOMPANIED MICHIGAN'S EMERGENCE FROM HER FORESTS

The lusty pageant of a State emerging from forests into farms is over. In 1924 Michigan's cut, taken chiefly in the Upper Peninsula, was under 800,000 feet, or less than 3 per cent of the national production. Yet above the Saginaw Valley the old logging days have set their ineffaceable mark, inasmuch as most of the towns in that region began as lumber camps and evolved out of that industry.

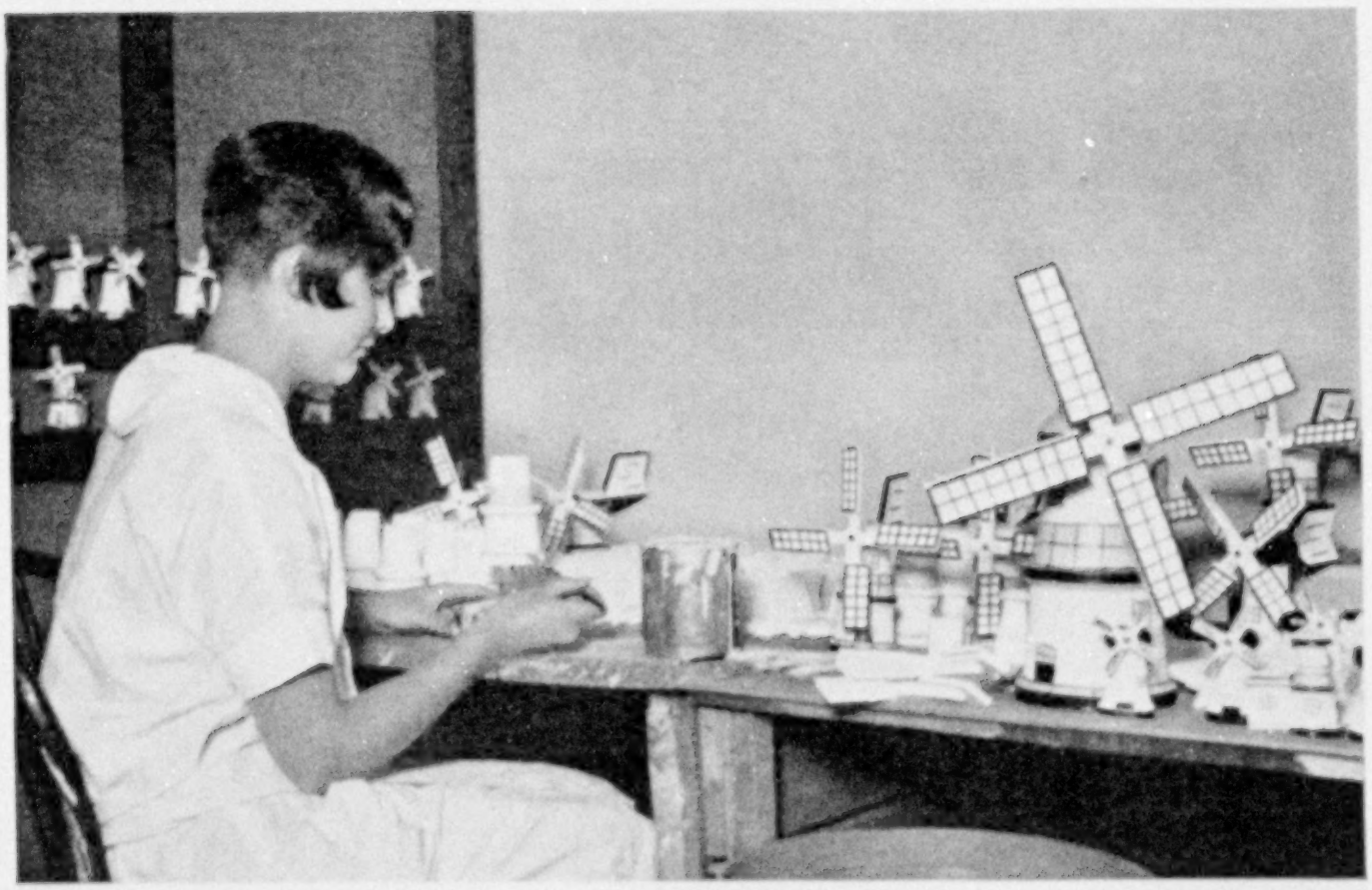
But the young State's transition period from lumbering to manufacturing was not accomplished without growing pains. Her forests shorn, a host of lumber towns—Ludington, Cheboygan, Bay City, Manistee, Alpena, Muskegon, Saginaw—relapsed temporarily into stagnation or ruin.

The story of Muskegon, sometime the "Lumber Queen" of the west coast, is typical. Her glories fled, her people trekked, and grass grew in her streets. Then slowly she rebuilt herself on the deserts left by vanished sawmills. How the woodworking, automotive, and other industries have lifted the once-ruined town to her present prosperity is one of the most striking stories in Michigan annals.

Saginaw, once such a "Sawmill City" that her shore area was materially enlarged by filling in the shallow lagoons with incalculable tons of sawdust, represents a similar rise, fall, and comeback. To-day she actually pays more in freight bills on her automotive and other products than her famed lumber cut was worth 40 years ago.

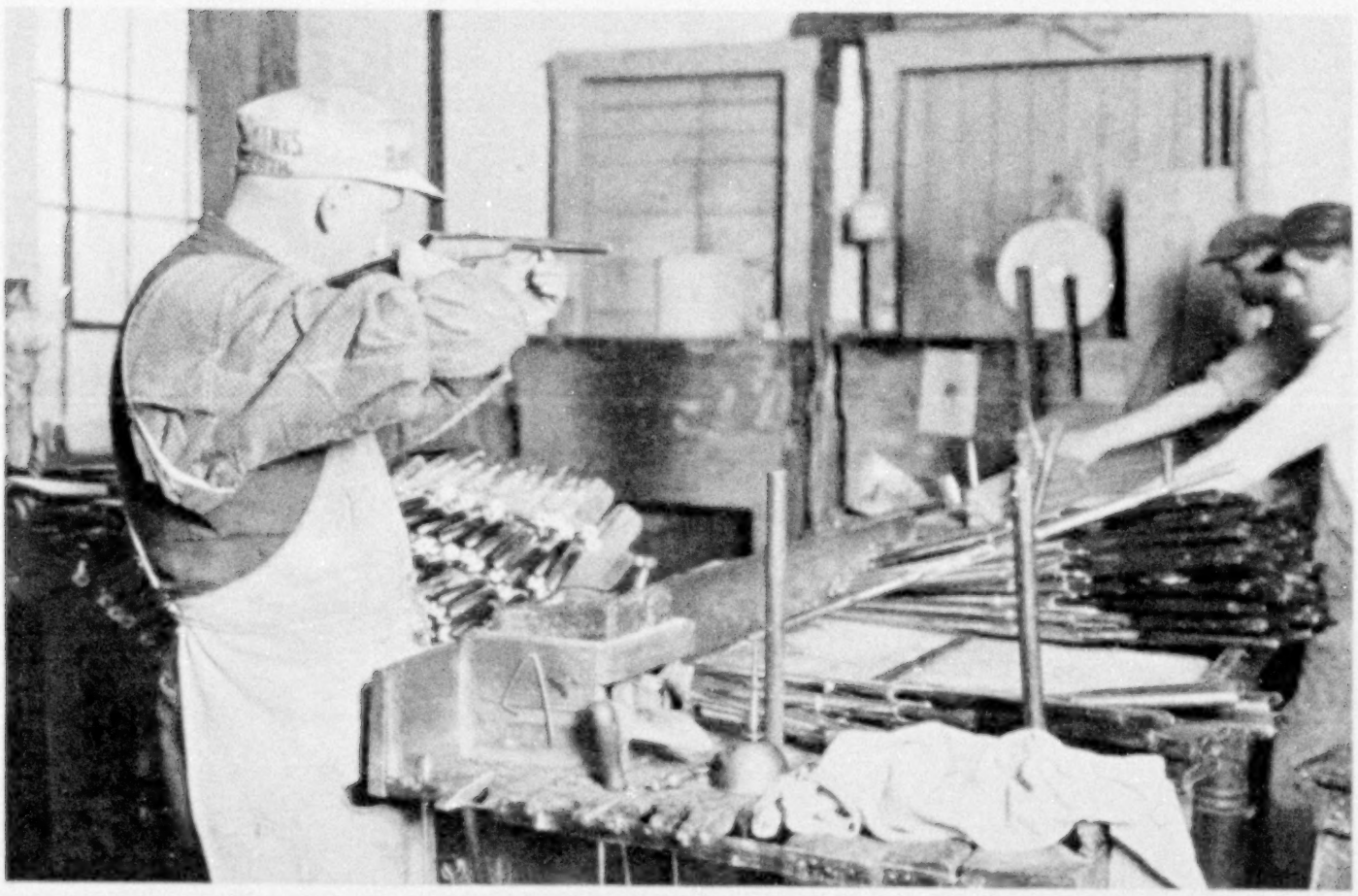
WOODEN SHOES ARE AMONG MICHIGAN'S MANUFACTURES

Some years ago one of the many Dutch settlers near Holland made wooden shoes for his neighbors. To-day his sons carry on the business, but make only miniatures, to be sold in souvenir stores and at gas stations.



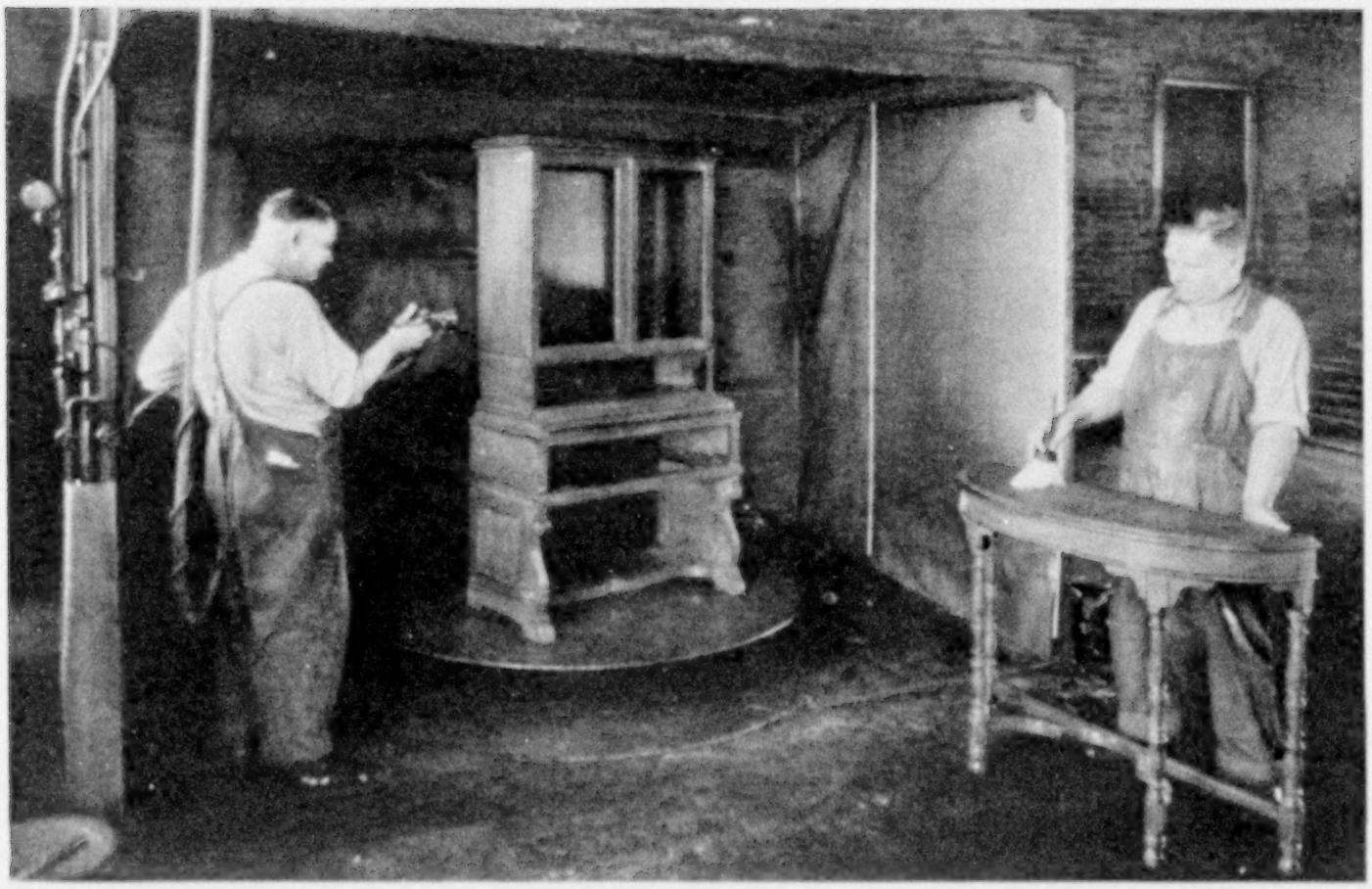
GIRLS PAINT TOYS FOR THE TOURIST TRADE

At Holland, Michigan, there is a factory which makes toy windmills. This is a new industry, but it is growing rapidly, due largely to the popularity of its products with tourists.



MICHIGAN MAKES MORE THAN NINE-TENTHS OF THE WORLD'S AIR RIFLES

This workman tests the accuracy of the finished rifles in one of the Plymouth plants. He believes he enjoys the unique distinction of having fired more shots from more guns than any other living man, having shot rifles all day long six days per week for 33 years.



A VARNISH SPRAY BOOTH IN A MICHIGAN FURNITURE FACTORY

This new process of spraying paint and varnish on furniture is much more rapid than the old hand-and-brush method. It also produces a smoother and more uniform finish.

THE NAME OF GRAND RAPIDS HAS BECOME SYNONYMOUS WITH GOOD FURNITURE

Probably no other single center in the world exerts so strong and significant an influence upon the furniture trade as does Grand Rapids. The biannual furniture fair brings together exhibitors and buyers from all the States and many foreign countries (see text, page 300). Despite the proficiency of modern machine methods, much decoration is still best accomplished by hand.

Flint took refuge in carriage building. Many a town started diversified woodworking as a stop-gap. Citizens at Ludington, Manistee, and elsewhere bored the earth, produced brines, and made the steam of lumber mills evaporate the brine into salt.

There was a state-wide spectacle of Michigan remaking herself. But not until around the turn of the present century did she set a firm foot on the industrial ladder, up which she has since made so spectacular an ascent.

In 1894 a Detroit citizen had appeared on the street in a veritable gas buggy, with high, iron-tired wheels and dashboard included. Whip sockets occasionally ornamented those early models of the automobile. Indeed, so balky were they that a pair of shafts wouldn't have been amiss.

In 1905 a Michigan manufacturer, who was then turning out 6,500 cars a year, placarded his plant as "the largest automobile factory in the world." That was the first year when, by the startling innovation of a sidedoor, you could make a gentlemanly descent instead of putting your car end-first against the curb, like a patrol wagon.

The State's statistical experts maintain that to-day Michigan is producing approximately 80 per cent of the world's automobiles. The output in 1926 was in excess of 3,200,000 cars.

FLINT SWITCHES TO "HORSELESS CARRIAGES"

Flint, which in 1904 switched from carriages to "horseless carriages" as an industry, ranks second to Detroit in the State's automotive production (see illustration, page 286).

Her recent history reads as if she had rubbed some industrial Aladdin's lamp. Between 1910 and 1926 the influx of her factory population from Mexico, Canada, and all Europe transformed this town of 35,000 into an industrial beehive of 137,000.

To handle this quadrupled growth, the employers laid out and built an entire suburb comprising 1,000 acres and 1,400 houses. Its charming aspect, its low installment plan of home-owning, as well as the factory workers' clubrooms and technical schools, form a unique object lesson in the enlightened handling of mass employment.

Rather than call the long roll of Michigan's towns which are engaged in the automotive and auxiliary industries, it may be said that 28 towns are so engaged, 187 separate establishments are involved, and their 282,000 employees represent a daily payroll of $2,000,000.

THE STATE UNIVERSITY HAS HELPED TO SOLVE A BIG PROBLEM

Happily, industrialized Michigan's foreign-population problem is lessened by her efficient system of education. This dates back to the founding of her State university in 1837.

When as yet her territory was a roadless wilderness, there were framed proposals to found "The Catholepistemiad of Michigania." Later this tremendous title was discarded, and to-day, by popular voice, the university has become, simply, "Ann Arbor."

It is negligible whether legend rightly derives that name from the arbor of bygone Mistress Ann Rumsey, for in fact this charming university town is as arboreal as those leafy shades which one associates with Platonic discourse.

Around its 40-acre campus and along the radiating streets are clustered the main buildings devoted to university work. Angell Hall, the Lawyers' Club, with its fine reminiscences of London's Inns of Court; the stately Clements Library, with its priceless Americana from Sir Henry Clinton's archives—these and many another architectural picture, framed among spreading trees, tempt the visitor to return (see illustrations, pages 288 and 289).

Among the first founded of our State universities, Ann Arbor's early success greatly influenced the growth of the state-university idea in the West and Northwest.

Ann Arbor has been coeducational since 1876, and was the first university to admit women to its medical school on an equality with men.

Hillset over the Huron Valley's rolling expanse, and with a student body of more than 10,000, the university is fringed inci-

A CLOUDY MORNING ON GRAND LAKE, NORTH OF ALPENA

Michigan is dotted with thousands of such lakes, which provide ideal settings for summer cottages and palatial residences.

dentally by a town; that is to say, Ann Arbor will always mean a university, as Oxford and Heidelberg connote universities.

With one-half of her land area in farms and two-thirds of this farm area improved or tillable, Michigan in farm acreage ranks just midway among the States.

Her long-established reputation for garden-seed production is protected by one of the most effective of laws and by a staff of seed analysts whose findings are widely published.

Southwest of Lansing the Indian place-name of Kalamazoo ("beautiful water") still holds true by reason of the cold springs which once refreshed the red man and nowadays refresh a muck-land celery crop valued at upward of $2,000,000 (see illustration, page 291).

The same muck region puts Michigan topmost, along with northern Indiana, in peppermint. These two sections produce, for pharmaceutical and other purposes, 85 per cent of the United States' supply.

Kalamazoo's paper factories, which have produced bond and book stock for fifty years, instance how Michigan turned to manufacturing when her lumbering peak had passed (see illustration, page 293).

MICHIGAN'S GREAT FURNITURE FAIR ATTRACTS THOUSANDS OF BUYERS

Who doesn't love a fair? Who hasn't warmed over narratives of medieval Europe's big sales shows, with their merchants and jugglers and menageries, and cries of "What d'ye lack?" Yet it may surprise some to learn that biannually Michigan stages quite as colorful a fair as ever took place in Europe's marts.

"Come one, come all! There's going to be doings at Grand Rapids next June! Rodeo, opera, vaudeville—what d'ye lack? Bring your wife and family, Mr. Buyer, and incidentally don't forget to glance over our little display of 13,000 pieces of household furniture!" That is about the siren song of the fair's management.

Grand Rapids' furniture market comprises an international aggregation of manufacturers, buyers, and salesmen. From a score of States and from European countries come the displays of furniture and interior decoration. These are disposed on the vast floor spaces of 20

A COW MOOSE BADLY FLY-BITTEN AND ILL-TEMPERED

She came to attack three times, but lost courage each time when the photographer stood fast.

Photographs by Frank M. Warren

A DENIZEN OF ISLE ROYAL

This two-year-old bull moose was within six feet of the canoe from which the photograph was snapped. He was approached quietly up wind while feeding on subaqueous plants.

SUPPER TIME ON THE 200-ACRE STATE GAME FARM AT MASON

These five-months-old fawns, on the propagation farm maintained by the State Department of Conservation, have been secured by game wardens from game refuges in other parts of Michigan. When older they will be distributed to other refuges or to public parks. The appearance of the attendant with a bottle and a bucket of warm milk causes a stampede for supper.

factory showrooms and 10 specially built exhibition buildings. The buyers, of whom 3,000 are sometimes present, hail from every State in the Union and from half a dozen foreign countries.

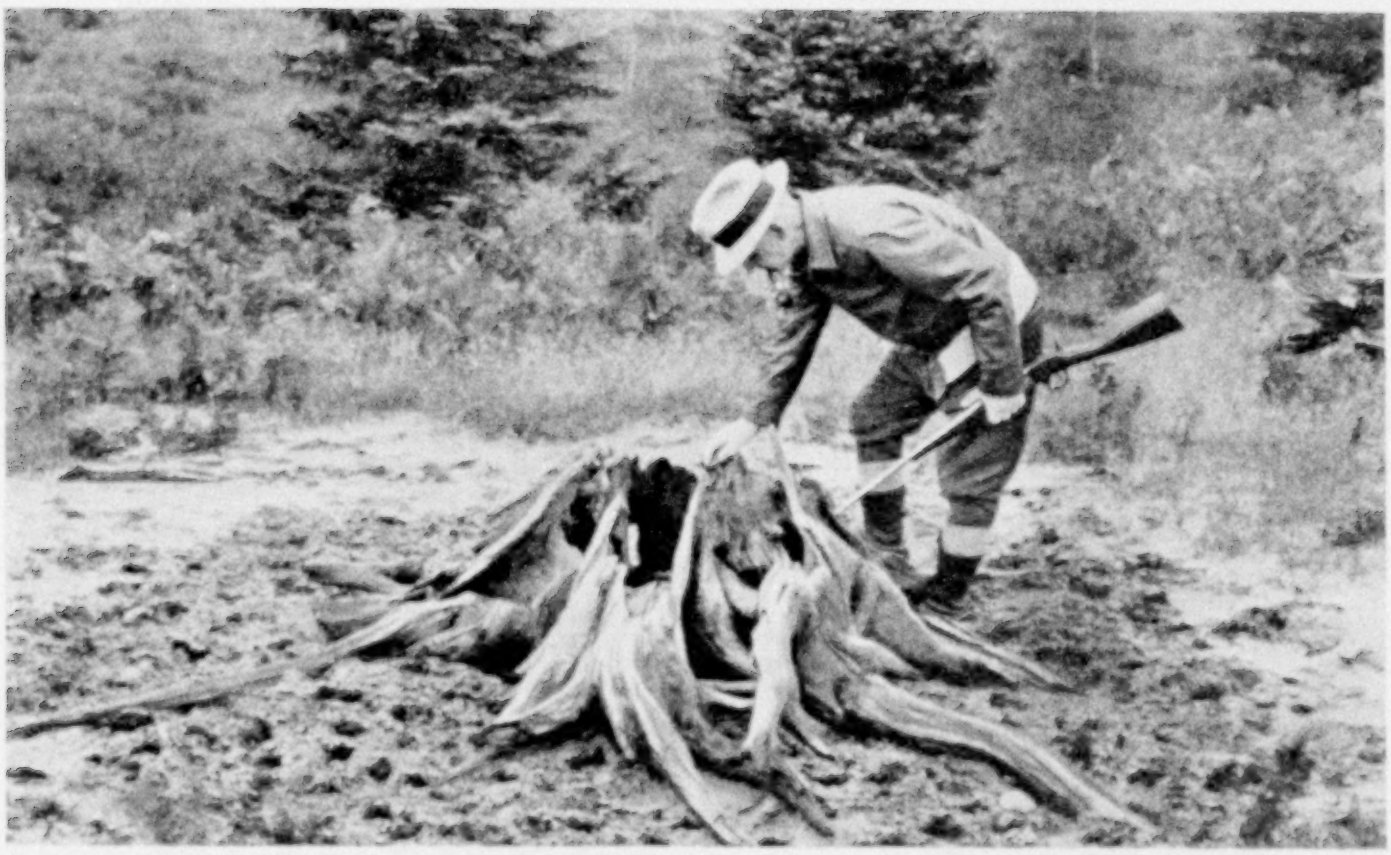
As modistes go to Paris for style trends, so furniture buyers go to Grand Rapids. Hence, for 20 years far-distant factories have exhibited their wares there, until it has become an international furniture mart.

Its 75 furniture factories, employing 14,000 people, represent an annual products value of $50,000,000. A large preponderance of Hollanders, who still nourish the old craft-spirit tradition, is to be found among the local furniture and cabinetmakers (see illustrations, pages 297 and 298).

But it is between Grand Rapids' environs and Lake Michigan's eastern shore that, as the Dutch folk and their ways be-

A BEAVER LODGE IN ONE OF THE PLEASANT PENINSULA'S LAKES

Various families of beaver have added additional chambers to this lodge until it has assumed the proportions of an apartment house. Its only doorway is below water level, but its sleeping chambers are dry and safe, under the domed roof, which is reenforced by a covering of logs and branches cemented with calcareous mud from the lake bottom.



A DEER HAUNT ON THE UPPER PENINSULA

Once this was a large pine stump, which was salted and used as a lick by the many deer in the Doe Lake Club preserve near Wetmore. The wood still is impregnated with the salt and is gradually being licked away by the rough tongues of the deer, many of whose tracks are to be seen in the sand.

© Frank M. Warren

MANY WILD CREATURES, RARE ELSEWHERE, ARE STILL TO BE FOUND ON ISLE ROYAL

This rugged island in Lake Superior is almost as innocent of civilization to-day as in the centuries past, when trappers paddling by were its only visitors. Its ridges, gorges, and cliffs are clothed with heavy virgin forests of pine, birch, and sugar maple. Large herds of moose and caribou still roam here. The cow moose seen coming ashore has been feeding in six feet of water. When she puts her head down to graze on the succulent vegetation on the bottom, she is entirely submerged (see, also, text, page 312).

come more in evidence, you encounter a delightful surprise.

A GLIMPSE OF HOLLAND TRANSPLANTED

First you pass acres of truck greenhouses; then you glimpse small-farm methods of cultivation. Finally the sight of green meadows, with herds of speckled cattle dotting the misty, tree-fringed vistas, makes you rub your eyes for the expected concomitant of Netherlands' windmills and canals; for, these excepted, the scene is strikingly Dutch. Moreover, the names of successive towns — Vriesland, Zeeland, Holland—are suggestive.

The Grand Rapids greenhouse region, as part of the State's under-glass cultivation of approximately 6,000,000 square feet, supplies lettuce and tomatoes to the Middle States during those months when such products are normally out of season.

Holland is said to be the largest Dutch settlement in the country. In 1847 its founders, fleeing overseas from unhappy conditions in the mother country, tented on west Michigan's meadows. Nowadays its manufactures amount to many millions of dollars a year. Numerous of its factory hands still speak only Dutch, and until recently the Dutch wooden shoe was made locally for neighboring farmers.

The region possesses one distinctly picturesque industry, that of giving day-old chicks joyrides to farms in distant States. That just-hatched chicks can carry on for two days without nourishment renders it possible to pack them in ventilated cardboard boxes and ship them by parcel post.

In May, 1926, the Holland post office handled 300,000 of what are certainly the world's youngest of long-distance travelers.

THE STATE HAS A PROFITABLE "RECREATIONAL INDUSTRY"

The automobile circle tour around Lake Michigan measures 960 miles. To this, Michigan's west coast contributes 400 miles of highly diversified playgrounds. These range from sand-dune parks and cove-commanding camps in pine groves to cottage and hotel life on the innumerable inner and outer waters which fringe this wonderfully variegated lake shore.

With fishing, boating, and camping to be found practically everywhere that the Great Lakes wash her shores, coastal Michigan might well be described as the window of the inland Middle States.

Many summer visitors spend their vacations in the free camps which are situated in various of the sixty-odd State parks. The large numbers are mainly due to the automotive development and the parallel development of good roads. Apparently Michigan, so largely responsible for automotive mass production, has won the right to the local phrase which rather quaintly describes this summer touring as her "recreational industry."

MICHIGAN'S DUNES PRESENT CONTRASTS OF FLOWERS AND DESERT

The west coast's striking sand dunes, extending coastally from the Indiana border to the Leelanau Peninsula and rising to a height of from 50 to 180 feet, might be described as dwarf descendants of the great Ice Age; that is to say, postglacial Lake Michigan's level was 20 feet higher, and at places the shoreline was indented from 30 to 40 miles more deeply than at present. In time the excess water withdrew, the centuries' winds swept the exposed sands shoreward, and these lovely dune lands took form (see page 309).

But one must not slight the claims of Paupukkeewis. Myth lovers will recall that this heap-big terpsichorean created Michigan's sand dunes while performing the Charleston, or some such lively dance, at Hiawatha's wedding:

> "Stamped upon the sand, and tossed it
> Wildly in the air around him. . . .
> Like great snowdrifts o'er the landscape,
> Heaping all the shores with Sand Dunes."

Some of the dunes have stabilized themselves with tree and flower, cedar, juniper, hepatica, ladyslipper, violet, and orchid. Against these the barren dunes wage jealous warfare, often sweeping forward to engulf them, while exposing to rearward a veritable cemetery of tree skeletons.* Yes, the old Indian dancer will still be at his mad antics, and the dune parks at Muskegon and Big Sable Point might justly be named after Paupukkeewis.

Halfway up the west coast the salt works at Ludington and Manistee repre-

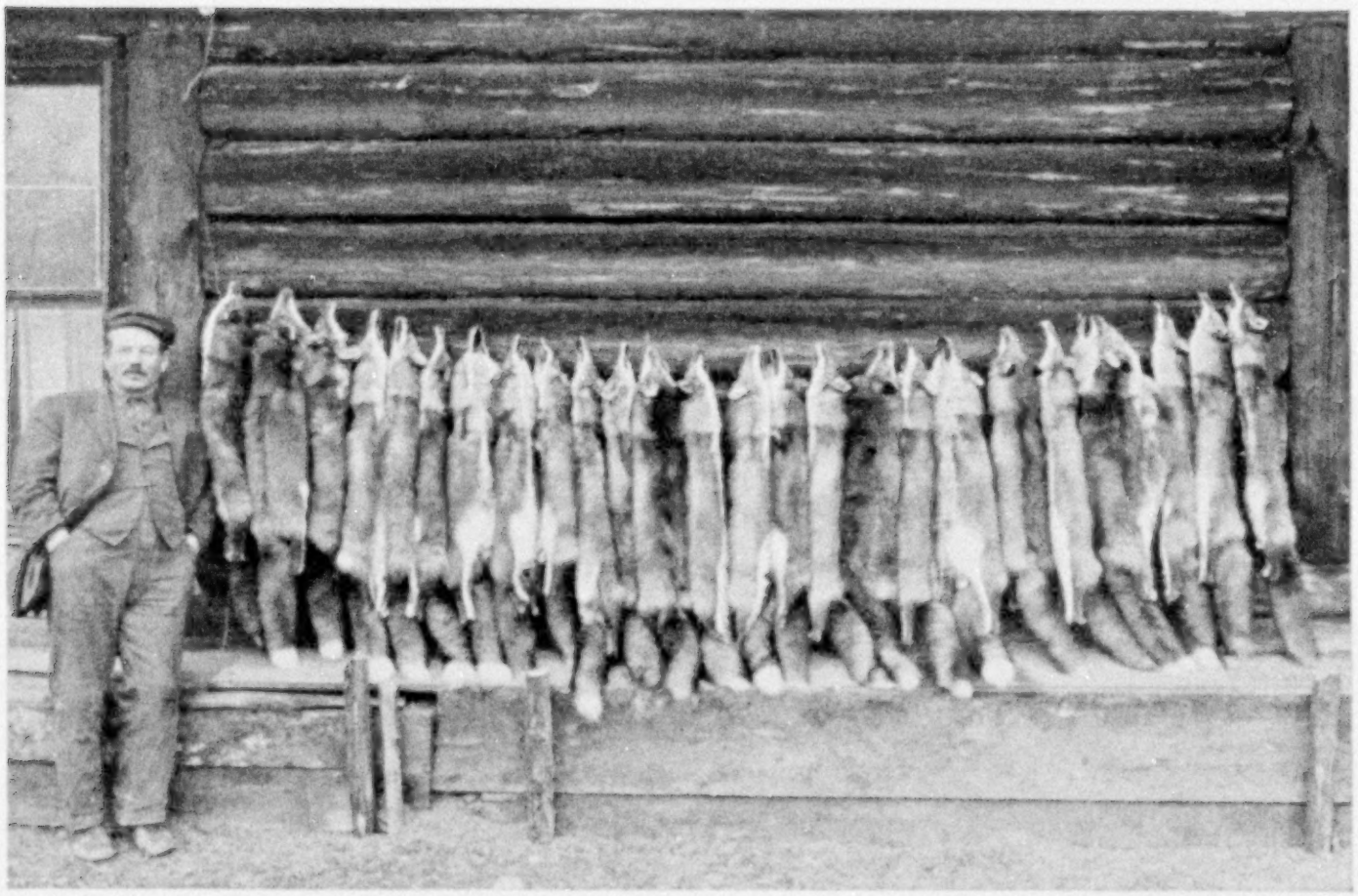
* See, also, "Indiana's Unrivaled Sand Dunes," by Orpheus Moyer Schantz, in the NATIONAL GEOGRAPHIC MAGAZINE for May, 1919.

BEFORE GOING OUT INTO LAKE HURON FOR THE DAY'S FISHING

Fishermen of Oscoda are inspecting their nets for rents torn during the previous day's work. In the fall, whitefish and lake trout are caught for the market. When the supply exceeds the demand, the fish are frozen and kept in cold storage.

BOXES OF LAKE TROUT

This Lake Michigan power fishing boat is just in from the morning's work with the nets off Charlevoix (see, also, text, page 312).



A FRENCH TRAPPER'S TWO WEEKS' CATCH OF RED FOX SKINS ON THE TURTLE LAKE CLUB RESERVATION

As the red fox is extremely difficult to catch in a trap, a bag of 30 taken in a fortnight is unusual.

sent a replacement industry which followed the logging era (see pages 310 and 311).

Age-old terrestrial convulsions at a time when some vast sea covered Michigan—these and the sea water's subsequent evaporation, with yet later strata of rock folding themselves over the crystallized salt—account for the great subterranean salt bed which stretches across the Lower Peninsula.

In 1881 a bed 32 feet thick was struck at about 2,000 feet. Michigan, which prior to this time had bought salt from other States, leaped to the head of the industry. In 1895 chemicalizing treatment began, and twenty years later Detroit's factories were producing annually 200,000 tons of soda products.

The pumped-up brine, high in mineral concentration, is evaporated by steam heat, then purified and refined. Michigan now produces 2,000,000 tons of this salt annually for chemical and manufacturing purposes.

In mid-May the west coast's gigantic salt towers overlook one of the loveliest of spectacles, a sea of white and pink blossoms. For 160 miles an unbroken stretch of these enriches the way from Muskegon to Traverse City. On one hand lies the vast lake, with its grotesque dunes, and on the other, orchards shower their "confetti of spring."

Running north and south, this lakeside fruit belt has the advantage of consecutive ripening times, and hence of consecutive marketing periods, which extend over four weeks. Moreover, the relatively cool lake winds retard the buds and decrease the frost peril.

Michigan ranks foremost in small-fruit acreage and leads all States in cherry growing.

WHERE PRODUCTIVE NATURE WAS SLAIN

Halfway across the State from this joyous blossom belt lies a gaunt region where spring comes in vain to quicken the scabrous, fire-scarred earth. Nine million acres of desolation! Men call them "the cut-over lands"—this haunt of Nature's specter, where through empty eye sockets she stares reproach at man's abuse of her.

A PASSENGER STEAMER LEAVING THE BLACK RIVER, SOUTH HAVEN, BOUND FOR CHICAGO

Caring little, the pioneer logger left "slash" which, burning, killed the young growth. Caring less, the pioneer farmer actually burned surrounding growths as a protection against forest fires. But his Nemesis came, in that the sandy soil rapidly exhausted itself. Then man and his kine trekked, and over the fire-scarred land, which could yield neither crops nor fodder, fell utter silence.

Nature was dead.

Wholesale tax defaultings caused entire counties lying within these lands to revert to the State. These reversions averaged 3,000 acres a month as recently as 1923-1924.

Somewhat more than 20 years ago Michigan started scientific reforestation as the only possible means of restoring these unproductive acres to usefulness. But it is easier to destroy than to recreate, and the present planting rate of 10,000 acres a year suggests a long job ahead for the coöperating forces of Federal and State governments.

The lesson that the State learned from her forefathers' mistakes is now blazoned on her every woodland road in the appeal, "Keep Michigan green!"

From the "little finger of the mitten," at Traverse City, and northward alongshore, the scenic wilderness intensifies. The multiplying white birches seem to whisper of legendary times. At last the six-mile strait and the whole glorious region of Michilimackinac—the tips of two peninsulas and the junction of three inland seas—sweep into view.

A FOCAL POINT OF HISTORY, LEGEND, AND ROMANCE

Here focus history, legend, and romance. China-hunting Nicolet passed this way. Yonder is St. Ignace, founded by Fathers Marquette and Dablon. Heroic La Salle canoed these waters. Against the horizon rises Mackinac Island, from whose now-vanished fort Cadillac once commanded the strait. And, if ghosts could sing, you would probably hear the paddling ballads of the *coureurs de bois*, those wild boatsmen-woodsmen, half French, half Indian, who, in their fur-heaped canoes, still seem to haunt the scene.

Michilimackinac means "the great turtle," and refers to the shape of the beautiful island which the French called Macquina. Nowadays 1,000 or more summer

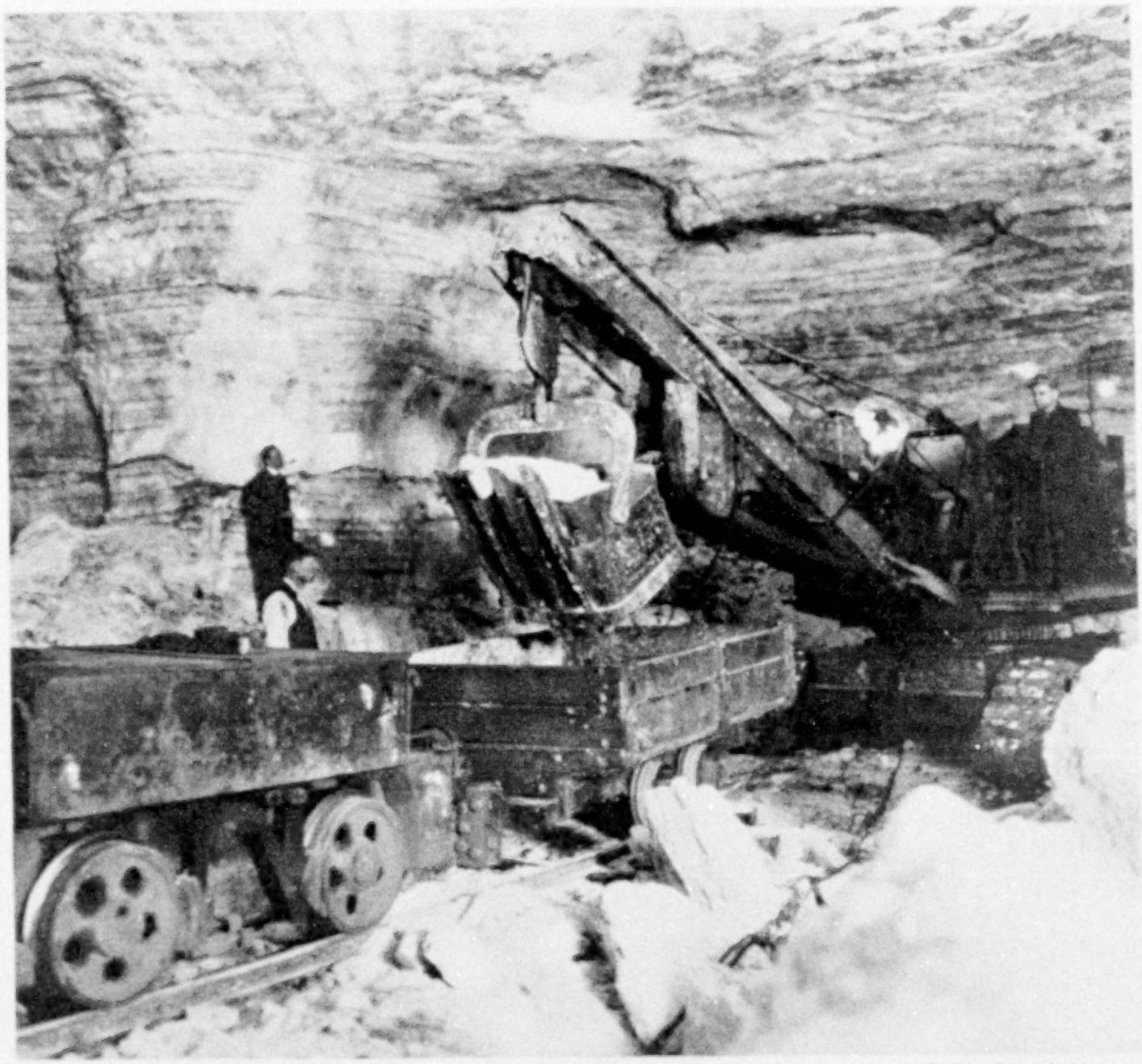
THE SAND JUMP AMONG THE MICHIGAN DUNES

All the fun of "falling a mile" without the danger of "stopping so quick."

Photographs by George R. Fox

HOW THE DUNE MOVES ONWARD

The front of this sand wave has advanced more than 40 feet in five years. It is pushing forward on three fronts, engulfing trees and shrubbery in its irresistible march (see text, page 305).



© The *Detroit News*

MINING SALT ON THE RIVER ROUGE, NEAR DETROIT

Michigan owes her salt deposits to a great inland sea that occupied her present area some millions of years ago. Only after lumbering had ceased to be a bonanza did her people turn seriously to mining their saline wealth (see, also, text, page 305).

tourists are driven daily through its fairy-like woods.

Motorcars being prohibited on Mackinac Island, only the sleepy sounds of "Whoa!" and "Giddap!" disturb its woodland glades. Gasoline belongs to another century than that from which the island draws its mellow charm.

So you rejoin your car at Mackinaw City, ferry it across to St. Ignace, and find yourself in the Upper Peninsula.

A 400-mile drive from St. Ignace to Ironwood leaves one impressed by the Upper Peninsula's dimensions and contents. Indeed, lower Michigan was similarly surprised when, early in the nineteenth century, she began investigating this territorial award.

Following the dispute of 1835-1837 with Ohio over the so-called Toledo strip, Michigan reluctantly accepted the Upper Peninsula by way of compromise.

This legislative postscript to the newly erected Michigan proved to be larger than any one of seven Atlantic States. Contributing 30 per cent of the State's total area, it enlarged her total land surface to 57,480 square miles and advanced her area rank to 21st in the Nation and to second east of the Mississippi. It increased her coast line to the longest among the States. It gave her a maximum length which is

STORAGE ROOM IN THE SALT WORKS AT MANISTEE

The salt is refined from brine pumped from wells more than 2,000 feet deep. It is brought into the storage room on an overhead belt which deposits it in piles. This is the coarse grade, which is sacked and barreled for the packing-house trade.

best conveyed by saying that a circle centered on Detroit and described with Keweenaw Point as a radius will overlap Ottawa, Canada, Utica, New York, Washington, D. C., Bristol, Tennessee, and Cedar Rapids, Iowa.

NEWBORN MICHIGAN RECEIVED FABULOUS COPPER GIFT

Drive on from Ironwood to the Keweenaw country and you will be amazed by the mixture of wild scenery and economic wealth; for in the Calumet region, clustered on the fringes of a virgin forest 15 miles in breadth, lie some of the world's most valuable copper and iron mines. These mines constituted the "legislative postscript's" second surprise for newborn Michigan.

In 1842 James K. Paull discovered a huge bowlder of copper in the Ontonagon River. There followed the fame of the Calumet and Hecla lode in the Keweenaw and a copper output which is reckoned at seven billion pounds to date.

In 1845 Marji Gesick, a Chippewa chief, found at Ishpeming a lump of iron ore under a fallen pine. It was the forerunner of a high-grade ore output from the Marquette, Menominee, and Gogebic ranges. Usually reckoned at thrice the output of Sweden and equaled only by that of Minnesota, it varies between 12 and 15 million tons a year.

The early fame of Michigan's mines spread overseas, and thousands of Cornishmen immigrated to the Keweenaw. To-day an occasional "Cousin Jack" or "Cousin Jennie," as the Cornishman and his wife were generically known, can still be found to relate their childhood memories of Michigan's great mining boom.

You never know your luck. Michigan, whose thirty-odd mineral products are to-day valued at $122,000,000 a year, had yielded the Toledo strip and gained, instead, the basis of her future preëminence. But for the Toledo compromise she would not now rank among the Titans of the metal-using industries.

Copper Harbor, which lies adjacent to some of the Keweenaw's gemlike forest lakes, hints by its name that you are still on the trail of the red metal. It is a route

BLOCKS OF COPPER AWAITING SHIPMENT FROM HOUGHTON

These ingots are made of ore from the Keweenaw Peninsula, "the copper country" (see, also, text, page 311). The city of Houghton and Houghton County took the name of Douglas Houghton, State geologist, who first determined the vast mineral wealth of the district. One mining company alone has paid more than $40,000,000 in dividends.

which will lead you across Lake Superior to Isle Royal; for it is there that Michigan's copper history finds its roots in legend and myth.

RADISSON FOUND THE "FLOATING ISLAND OF COPPER"

About 1665 Pierre Radisson crossed Lake Superior, located what Indians had described as a floating island of copper, and learned the legend associated therewith. This told of how, long ago, a strange people had come repeatedly to the copper island until the enraged Indian sea god had foiled their pilferings by causing the island to wander eternally on the "Big-Sea-Water."

Latter-day discovery has revealed on Isle Royal and its surrounding archipelago many small copper pits with numberless stone hammerheads scattered around them.

Whether or not these prehistoric miners were Indians remains unknown. They left behind them no mound, burying place, or other clue. Their method was to heat the rock, dash water on it, and hammer out slivers of the metal. Discovered caches of copper suggest that they carried it southward via the Keweenaw and Sault Ste. Marie.

To-day Isle Royal is almost as virginally wild as when its mysterious miners labored there. Its 200 square miles of rugged ridges, deep gorges, and profiled cliffs are massed with a veritable "forest primeval" blazed only by wild animal trails. It is estimated that 2,000 head of deer, moose, and caribou roam there, and the island's familiars say that beavers work along its various streams (see pages 301, 303, and 304).

A census taker visiting Isle Royal out of summer season would find business very poor; for, the lighthouse men excepted, this remote outpost of the State's fishing industry would be uninhabited.

Nineteen fish species, principally lake trout, whitefish, and lake herring, form the State's annual catch, which some years amounts to more than 10,000 tons, valued at more than a million and a half dollars.

While a prosperous agriculture comprising more than 12,000 farms has developed in the Upper Peninsula, lumbering

TOMBSTONES OF A DEPARTED INDUSTRY

These ruins near Marquette mark the site of an old iron furnace which went out of blast 20 years ago. The cone-shaped roofs have fallen in.

constitutes its main industry. It is estimated that four-fifths of Michigan's standing timber is located there, and that at the present cutting rate the logging camps have still 40 years' work ahead of them.

As befits this "land of the Ojibways" and these "shores of Gitche Gumee," the peninsula retains in its massed forests and beautiful lakes a remote and romantic charm. It is a fitting haunt for such Indian demigods as Hiawatha and such epic woodsmen as Paul Bunyan.

"TALL" TALES AMID TALL TIMBERS

Visit any Upper Peninsula logging camp and you will find that the apocryphal Paul and his "blue ox, Babe," still live in tales as "tall" as the surrounding timber. Some say that Paul had his prototype in some gigantic French-Canadian lumberjack who participated in the Papineau Rebellion of 1837. Certainly by 1860 he had become a legendary hero whose Herculean exploits are known in Michigan, Washington, Oregon—wherever loggers foregather around the camp stove.

Paul, as a baby, tossed so tremendously as to prostrate 40 square miles of standing timber. Arrived at man's estate, he had his boot heels pegged with his initials, so that, when drunk, he could kick "P. B." into the rafters of ceilings eight feet overhead.

"Blue Babe" took on her peculiar hue by being left out in the famous blue snow. As she could walk only on ice, Paul sprinkled the snow with a gigantic hose, the leaks in which caused Niagara Falls. Babe's most famous exploit was being hitched to an 18-mile road with 16 hairpin curves, and hauling it straight.

The cycle of Bunyan tales is endless. Invariably they are related with a profound seriousness and an aping of truth by burlesque exactitude. For instance, Babe didn't "pree-cisely" measure 42 ax handles between the eyes, because "you could easy fit in a Star tobacco box after the last handle." Invariably, too, the narrator once knew Paul, or courted his daughter, or logged with him "where the Little Gimlet empties into the Great Auger."

Photograph from Melville Chater

THE YOUNGER GENERATION OF MICHIGAN STOCK RAISERS: MEMBERS OF A COUNTY CALF CLUB

Although this State has become an industrial Titan, she still maintains extensive and important agricultural interests. Many of her boys and girls from the farms are organized into clubs for instruction in more efficient and scientific methods of producing bumper crops and high-grade live stock.

Similarly, Hercules lore may well have originated among "tall talkers," who were merely showing their fellow Greeks a good time. Indeed, Paul is cousin-german to both Hercules and Thor. He is a genuine North American demigod, born among the toils and rough humors of the logging camps.

THE WORLD'S GREATEST BODY OF FRESH WATER

As for the Ojibways, what with inexhaustible supplies of metal and canoe materials at hand and the world's greatest fresh-water body at their doors, they might have founded a lake empire.

Lake Superior exceeds Lake Victoria, in Africa, its nearest rival in size, by about 5,000 square miles. Its shore line of 1,500 miles is longer than the air-line distance between Canada and the Gulf of Mexico. Its maximum recorded depth is 1,008 feet, and if its surface sank 602 feet it would then be at sea-level, with plenty of water left to float the world's navies.

The "last of the Ojibways" may still be found at various farming and fishing settlements in Chippewa and Baraga counties. Michigan's Indian population slightly exceeded 5,600 at the last census. At L'Anse you may still see the old Chippewa cemetery, with crude shelters erected over the graves, according to the burial custom witnessed three centuries ago by the Jesuit Fathers.

From Indians to industrialism is a far step. Hiawatha's appeal to the forest trees for raw materials wherewith to build his canoe is nationally famous; but were Hiawatha

THE WEST SIDE OF PRESQUE ISLE PARK, NORTH OF MARQUETTE

Many deer, secure from hunters, live on this island and are fed by game wardens during the severe winter months.

THE ARCHED GATEWAY OF THE SALLY PORT IN THE LOWER WALL OF OLD FORT MACKINAC

The statue in the park below is of Father Marquette, one of the French Missionaries of the 1670's (see text, page 276).

alive to-day, he would probably sing, "Give me of your wood, O Forest," and, "Give me of your ore, O Mine Pits," to the end that:

"I a motor car shall build me,
Build a limousine for touring."

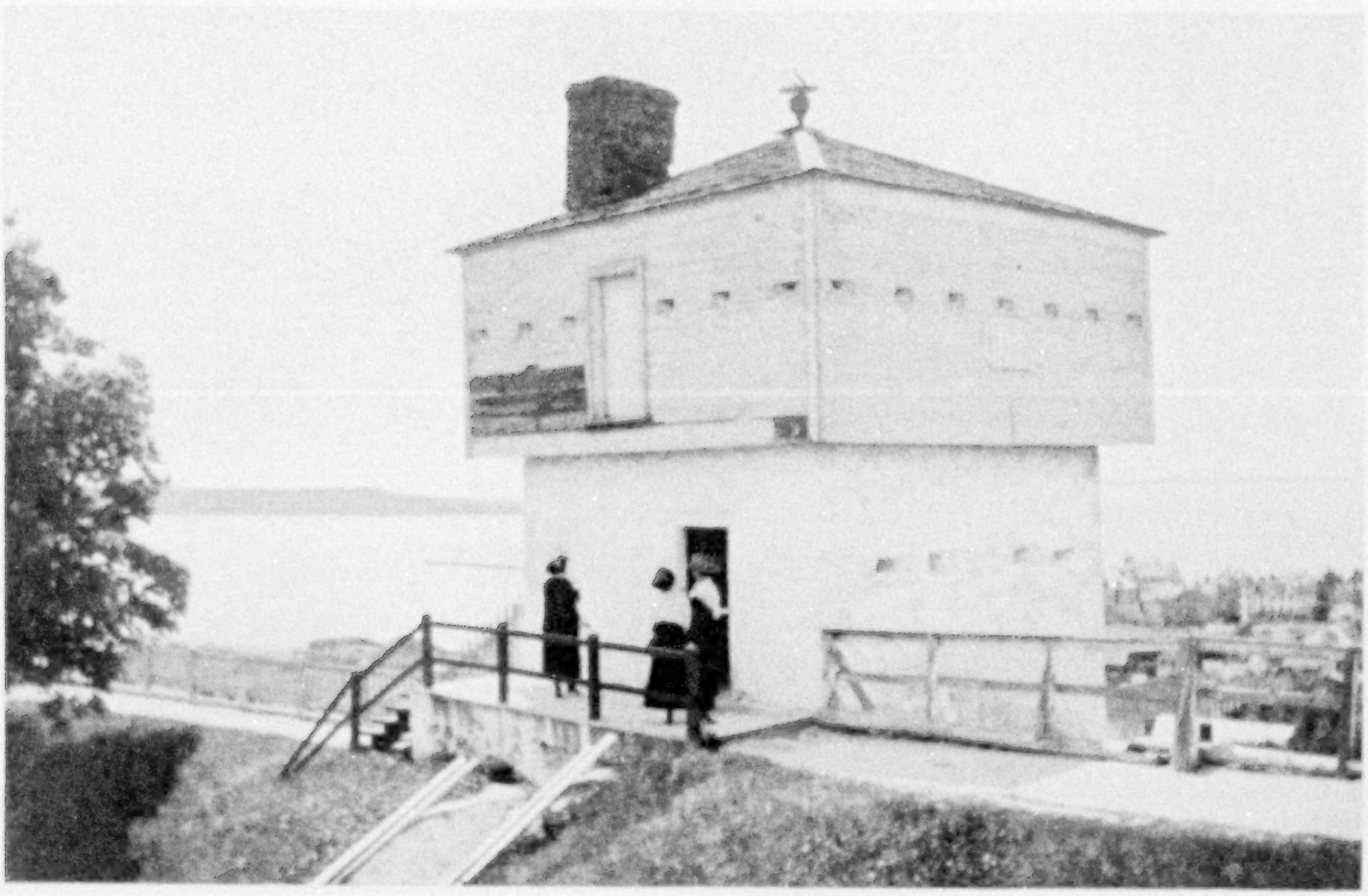
And, instead of paddling "down the rushing Taquamenaw," he would probably invoke that stream to furnish hydroelectricity.

THE WORLD'S GREATEST INLAND WATERWAY

Michigan develops from her major water-power plants more than 300,000 horsepower; but that form of power contributes, according to high or low river levels, only from a fifth to a third of the total horsepower needed.

The Sault contains in St. Marys Falls Ship Canal what has been termed the world's greatest inland waterway. Its passing ships constitute so mighty a pageant that the "Soo" locks might be described as the grandstand of the Great Lakes (see illustrations, pages 318, 321, 323, and 324).

In the now greatly diminished rapids the Ojibways speared "the deer of the waters"—*i. e.*, the whitefish—centuries before Frenchmen called the place the Sault,



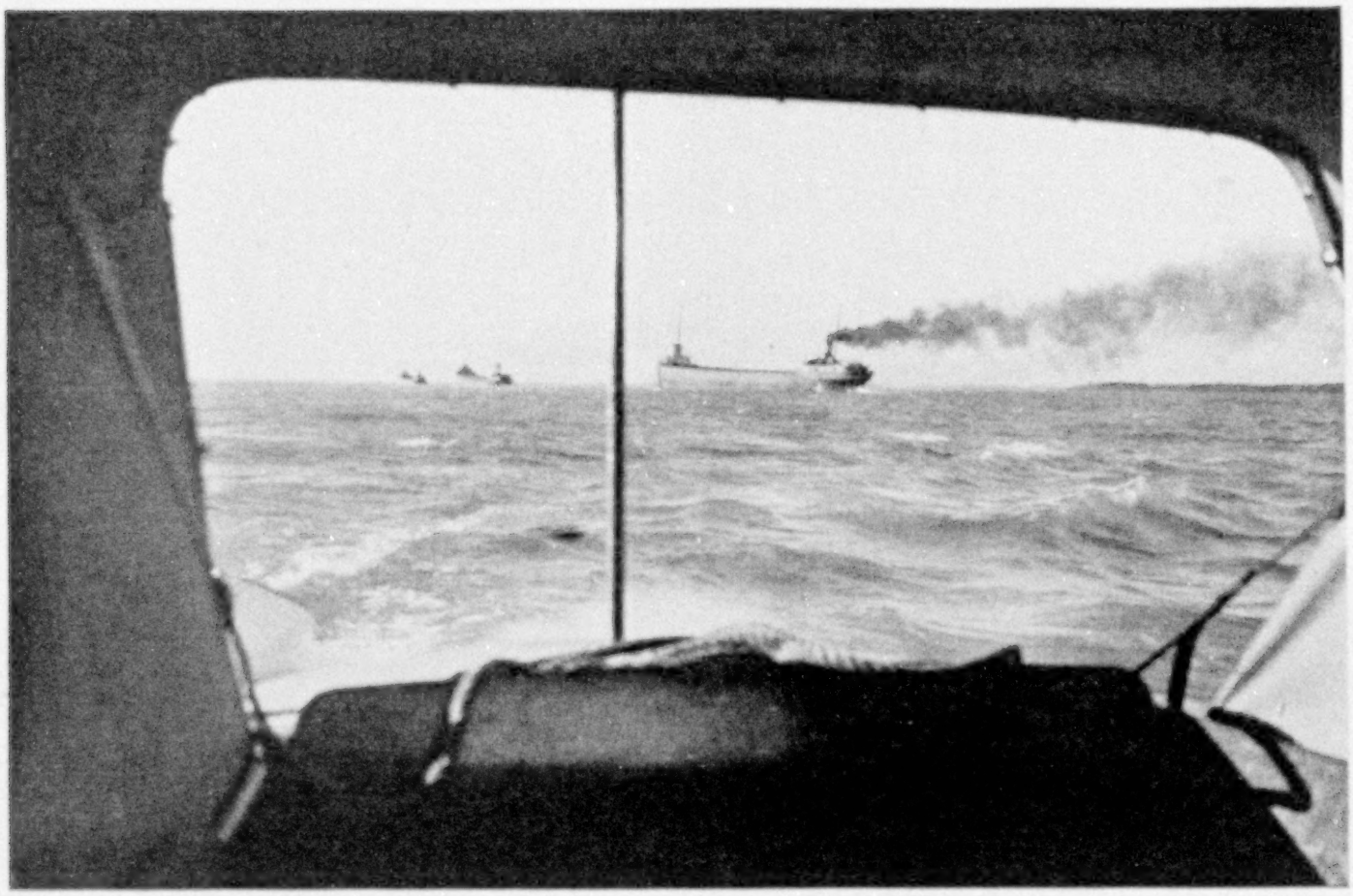
Photograph by Felix J. Koch

A CORNER TOWER OF THE OLD FORT AT MACKINAC ISLAND

This stronghold was once termed the Gibraltar of America because of its strategic position between Lake Huron and Lake Michigan. It was built by the British in 1780 and relinquished to the United States in 1796 (see, also, text, page 308).

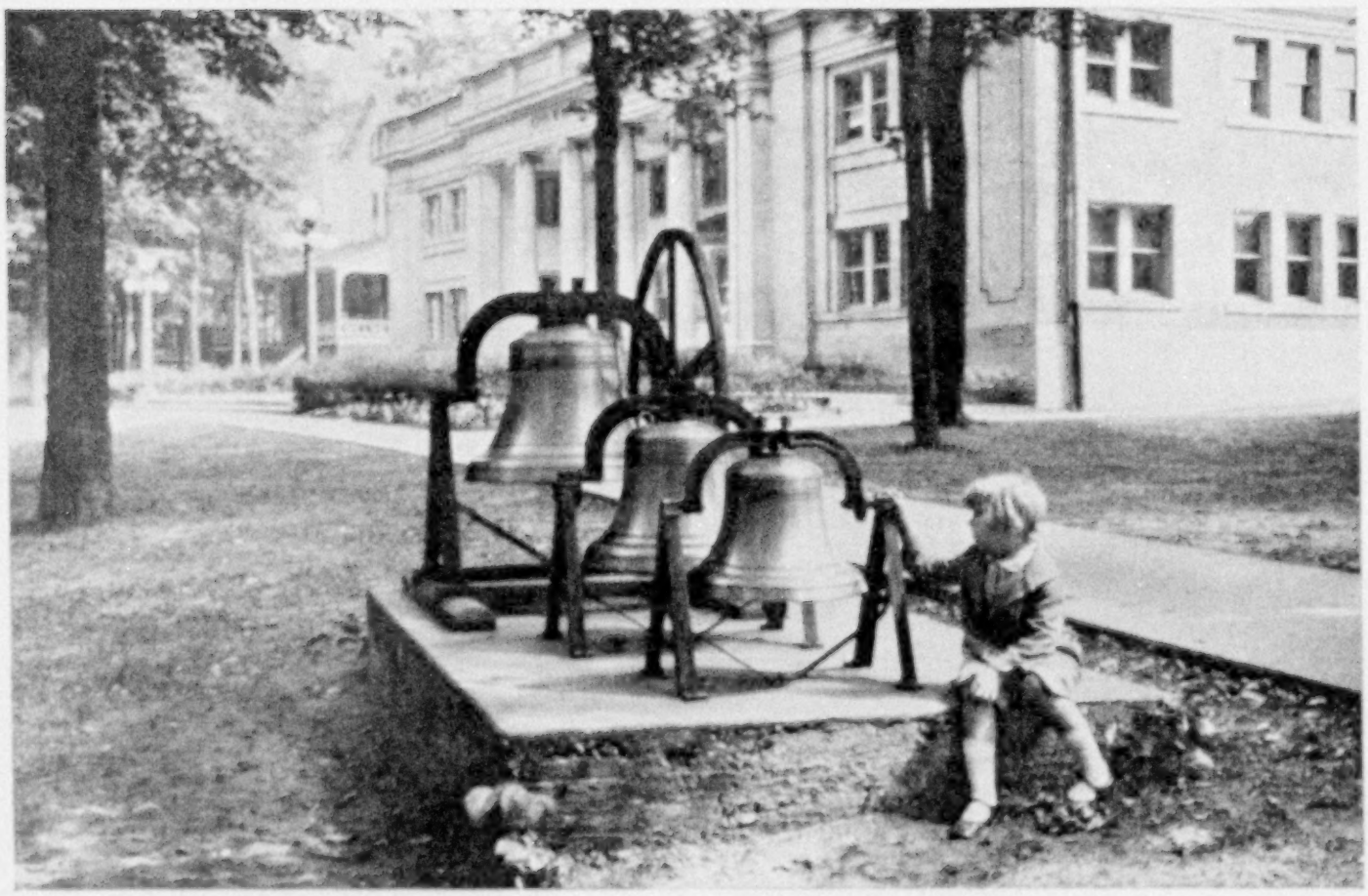
OLD INDIAN GRAVES IN THE CEMETERY AT DOLLAR SETTLEMENT, NEAR BRIMLEY

The wooden covers are for the protection of food, tobacco, etc., formerly brought to the graves by relatives of the departed. This custom has been discontinued. The cemetery is one of a scant few remaining in Michigan to-day.



"THE MARINE PARADE"

For eight months a year there is a continuous procession of large vessels on the St. Marys River below the "Soo."



THESE BELLS SUMMON THE VISITORS TO "CHAUTAUQUA"

During the summer their clarion tones announce the meetings of the Chautauqua, or "Assembly," at Bay View, a suburb of Petoskey, overlooking Lake Michigan.

THE SPORT OF HUNTING WITH THE CAMERA INSTEAD OF WITH THE GUN WAS ORIGINATED IN MICHIGAN

In this State a citizen of Marquette, George Shiras, 3d, made the first wild life photographs more than 40 years ago. Later he originated night photography of wild animals. As a member of the United States Congress, he wrote and introduced the original bills putting under Federal control migratory fish and migratory birds, which latter measure, known subsequently as the Weeks-McLean bill, became a law March 4, 1913. This act is the most important bird legislation ever enacted for the benefit of sportsmen, nature lovers, and agriculturists. It has brought about a rapid restoration of our mallard, canvasback, and other game birds which had been almost exterminated. See "The Wild Life of Lake Superior," "Photographing Wild Game With Flashlight and Camera," "Wild Animals That Took Their Own Pictures by Day and by Night," "One Season's Game-bag With the Camera," etc., by George Shiras, 3d, in the NATIONAL GEOGRAPHIC MAGAZINE. This picture shows Mr. Shiras holding two pairs of moose antlers interlocked, which he found on St. Ignace Island, Lake Superior. Each is of 50 inches spread, so inextricably joined in the deadly rivalry of the mating season that both contestants were vanquished forever.

or Falls, of Ste. Marie. There, in 1797-98, the North West Fur Company constructed a lock large enough to take canoes; yet the region was so uncomprehended that in 1840 Henry Clay characterized a proposal to canalize St. Marys River as "a work quite beyond the remotest settlement of the United States, if not in the moon."

GREAT LAKES INDUSTRY HAS DEVISED NEW METHODS OF LOADING SHIPS

One of the finest ore loading docks on Lake Superior is at Marquette. Big freighters come here from lower lake points, and ore deposited in the overhead bins from the dump cars of the ore trains runs from the spouts into the holds of the boats below. In this manner a ship of 14,000 tons has been loaded in 16½ minutes (see, also, text, page 325).

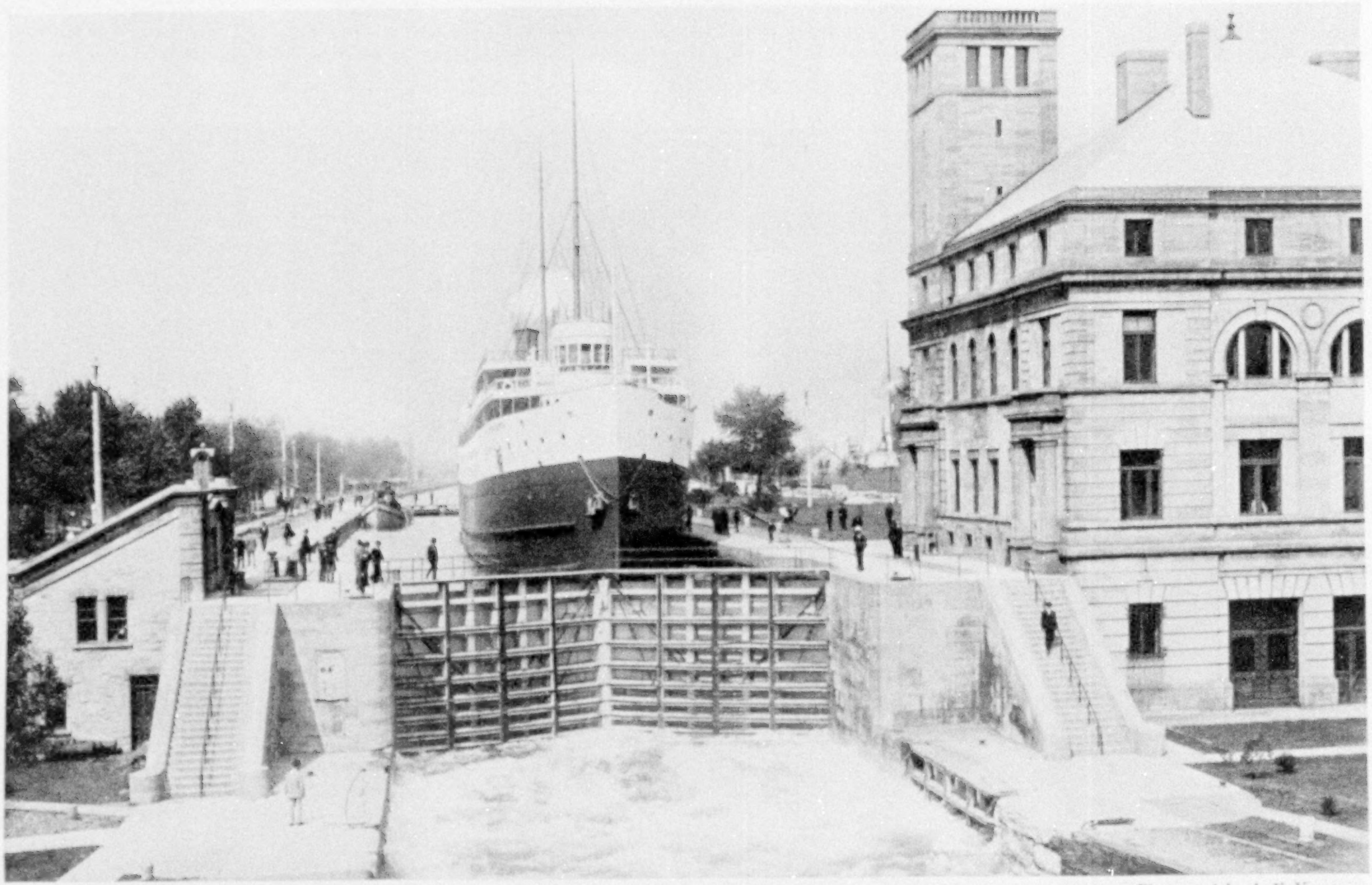
LEVIATHANS OF THE LAKES MEET AT THE SAULT

The great ore ships that carry iron from the Mesabi Range all pass through the locks at Sault Ste. Marie. The tonnage recorded at the Panama and Suez canals is far surpassed by that which is handled here (see text, page 325).

Photograph by A. E. Young

FREIGHTERS CAUGHT IN THE LAKE ICE

The ore and grain boats that make up the large fleet of freighters plying the Great Lakes are of a type well adapted to withstand the severe storms which frequently lash the "inland seas" into a fury. They weather these storms without assistance, but when winter seizes them in its icy grip they have sometimes to be very literally "tugged" out.



Photograph by A. E. Young

LOWERING A PASSENGER STEAMER FROM THE LAKE SUPERIOR TO THE LAKE HURON LEVEL, A DROP OF ABOUT 20 FEET

The gates behind the steamer having first been closed, the valves of the lock are opened and the water gradually flows out through the bottom and into the fore bay. When the level of the water inside the lock reaches that of the water on this side of the foreground gates, they will swing open and the ship will be ready to continue its journey on the Huron level. Sault Ste. Marie (see, also, page 324).

© A. E. Young

VIEW FROM THE AIR OF THE WORLD'S TWO LONGEST LOCKS: SAULT STE. MARIE, MICHIGAN

During the past five years, freight valued at more than five billions of dollars has passed through these locks. They are the channels through which the untold mineral riches of Lake Superior's shores and much of the golden grain of western Canada are distributed to the world (see text, page 325). What remains of the rapids may be seen in the background, and beyond is the Canadian shore.

When, in 1853-1855, American engineers harnessed St. Marys Falls as lifting power, they outraged all precedents by building two locks in tandem, each 350 feet long and 70 feet wide, with a 9-foot lift.

But in 1881 these were outstripped by the Weitzel lock, 515 feet in length and 80 feet in maximum width; and 15 years later this was in turn outstripped by the Poe lock, 800 feet long and 100 feet wide.

Finally, 1919 beheld the Sault banded by the world's two greatest locks. These have a usable length of 1,350 feet (thus exceeding the Panama locks by 350 feet), a width of 80 feet, and they carry a depth of 24½ feet of water.

Locks? Say, rather, the keys that unlock economic wealth! Of iron, copper, grain, and other commodities, more than 90,000,000 tons, valued at about $1,250,000,000, have been "unlocked" on St. Marys Falls Ship Canal in a single eight-months' season. In general, the Sault's annual traffic greatly exceeds that of the Panama, the Suez, the Kiel, and the Manchester ship canals combined.

Conservative computation shows that, after deducting operating costs and interest on the investment, the Soo canal system has saved in freight charges in one year nearly $90,000,000. And while, in fact, all vessels have passed toll-free ever since its transference to the Federal Government, in 1881, one may estimate its annual cost at under four mills per freight-ton handled.

In view of the Northwest's vast grain contributions and realizing that the Lake Superior region furnishes more than four-fifths of our iron ore, one perceives that any catastrophe befalling the Soo locks would reverberate economically through the East and even across the Atlantic. The iron-using trades would be paralyzed, armies of factory workers would be laid off, and England would experience a serious diminution in American flour. As to the consequent glut of commodities, 25 railway tracks to the seaboard and freight cars by the tens of thousands would be needed to cope with it.

Departure from Michigan by a freighter at the Sault makes one's farewell view of the State a truly impressive one. Indeed, you are doubly in luck if you can secure such accommodation. What is called "personal service" is magnificently eclipsed when some friendly official says he will ship you on the finest vessel passing that day. It means you will have your pick of 75 ships, for that is the average number clearing the locks every 24 hours.

While waiting, you watch the extraordinary sight of great vessels, inclosed in parallel locks, playing at slow-motion see-saw, as they rise or descend on their respective ways to Lake Superior or Lake Huron. Then one, which but just now looked as high as a house, sinks imperceptibly to the quay and you climb aboard.

Some 750 main vessels, or 1,200 in all, form the Great Lakes freight fleet. Nine of the biggest of these, lying stem to stern, would extend a mile. An ore carrier's cargo runs to 15,000 tons, and the loading of this is indeed a speed spectacle. Shot from pockets, through spouts, and into the ship's hold, a cargo of 14,000 tons has been loaded thus in 16½ minutes.

As your vessel drops down to Detroit and thence out upon Lake Erie, there is ever along the horizon some faint plume of smoke which tells of those tireless carriers, which, by day and night, through calm or storm, silently pursue their tasks in the work of national development.

MICHIGAN'S HISTORY IS INSEPARABLE FROM HER LAKES

If you would understand Michigan, arrive and depart by water; for the Lakes are inseparably bound up with her history, her development, her future. Between Monsieur Nicolet's arrival in Michigan and to-day, when industrially she ranks third or fourth among our States and produces yearly more than four billion dollars' worth of manufactures, there lies an economic development which would have stunned the China-hunting Frenchman's comprehension.

Reflecting on this, one wonders anew what symbol, better expressive of her progress, should replace that of the mitten.

Reach or leave Detroit by water, and your first glimpse, your last memory, is of its slim, towering stacks, grouped in fives, etched against the sky. They are like the upward-reaching fingers of some colossal hand. And perhaps that is the State's truest symbol. Michigan has stripped off the lumberjack's mitten and reveals the giant hand of industrial achievement.

XUM

ARTIST ADVENTURES ON THE ISLAND OF BALI

By Franklin Price Knott

With Natural Color Photographs by the Author

"WHAT with snakes, jungle fever, and nice striped tigers that dote on artists, you'll not get many pictures. Besides, rainstorms in the Dutch Indies last forty days and nights, and it's hotter there than the middle kettle of Hades."

With such serio-comic banter California friends heard my plans to sail for that Enchanted Isle of Bali, away over in eastern seas.

In every man's dreams there is always one favorite spot, somewhere, that he hopes some day to see. It may be a country itself; it may be its people, its great cities or art treasures; it may be but the primordial urge to fight for the sheer adventure of it—to seek romance in strange lands. But, some time in his life, the man of any imagination feels the call to far places. So it came that I went to Bali, that beautiful but little-known island of flowers and modern Eves, lying off beaten tourist trails, east of Java.

THE MAGIC OF AUTOCHROMES MAKES THE ARTIST A GEOGRAPHER

For years I was a painter of miniatures. Faces, beautiful and dull, ugly and interesting, passed before my brush.

Then came the magic of autochromes. By color photography, millions who read this magazine may glimpse the glories of Nature—God's own great studio. Like an artist's brush, now the camera catches every tint and shade from Arizona desert or Alpine sunset to the gorgeous panoply of Indian rajah courts and the bronze beauty of jungle maids asplash in lotus pools.

So it came I laid down my brushes and took up the color plates. And from the Ganges to the Great Wall, from Pyramids to Buddhist temples, I have wandered. To catch their color and portray these dream places to the millions here at home who long to see them—that, now, is my avocation.

It was tropic dawn—the soft, soothing, hazy dawn of a calm East Indian day—when we anchored off Buleleng, the town of many natives and a few Dutch on Bali's northern coast.

Brown men in a small boat took me ashore through blue-green surf; then set me down with my bags alone on the beach. It is a hybrid, palm-shaded town, part Dutch tin roofs and part the thatched huts of natives, this Beleleng, the first point of contact between an encroaching outer world and long-isolate Bali. But no hotel runners, no cab or taxi men leaped at me from the coconut groves. The island, as yet, knows them not. In fact, nobody paid me the slightest attention.

Half nude women, market-bound, marched by in stately parade, burdens on their heads. Lean dogs filed along, each intent on his own affairs. There passed a man with a red rooster tucked under his arm, and two small boys lugging a grunting sow in a wicker cage. But not one of them even looked at me. On Bali I was to learn that "mind your own business" is an unwritten law.

In fact, I might be there yet—alone on that Bali beach—had not a friendly white man, Andre Roosevelt, suddenly appeared. He was the one and only American living there, and he spoke the island tongue.

"Till you find shelter," he said, "I can put you up."

WHERE BIRDS TALK AND BUTTERFLIES FLY LIKE BIRDS

"Bali is a peculiar place," explained my host later, over our breakfast of bananas and rice. "Here books are bound from tree leaves. Religion is the chief occupation. Trial marriage usually takes. It's a land of the slimmest women and the fattest pigs. Birds talk and butterflies fly like birds. Praying to pagan gods and fooling pagan devils are the main pastimes. Tourist attractions are many, but

tourists few. Our island lies hard by the big path of round-the-world trippers, yet few see it—or even hear of it.

"It's a social and sociological curiosity, this island of Bali. Its natives are what biologists might call 'sports' in East Indian ethnology.

"It lies a night's cruise east of Java. It's about 90 miles long, with a 10,500 foot peak and more than a million peaceful, polygamous people. Its women are the fairest in all Malaysia—and a dressmaker would starve."

BALINESE BEAUTIES PROVE CAMERA-SHY

Happily, aided by my host, I found John, a Bali boy interpreter. A willing young guide he was, mixing Dutch with broken English and Malay, only to break out in voluble Balinese when excited. "You make picture? *Gewis!* I show you temple, flowers—and much purty girl."

But, as a diplomat, John's work had lumps in it. Time and again I glimpsed a pretty face and wanted to photograph it, only to have the girl run away when John asked her to pose.

There was one girl in particular on that island, a veritable Venus—straight, slim-limbed, graceful as a deer. Often I got fleeting glimpses of her. Sometimes she would be bathing with other girls in a wayside pool, or walking sedately to the temple with an offering of fruit or flowers. Time and again I sought to take her picture, but caught only the flash of her dazzling smile as she flitted swiftly away. In vain John pursued her. He might as well have shouted at a shy bird of paradise!

As John and I worked our way across Bali, toward its south shore, I was amazed to see how densely peopled it is, and how intensely tilled. Coco palms and tamarinds sway over the paths and rice fields are everywhere, even terraced far up the hillsides, as in Java, Japan, and the Igorot country.

The quest for photographic adventure along these island paths, past green fields, temples, and walled villages, is an endless delight—unless a carabao suddenly flounders up from the mud to chase the white man. Bali children ride these clumsy creatures, and even when one runs amuck it is said a small boy swishing a switch through the air may cause the mad beast to turn aside in his charge. But here, as in the Philippines, there seems to be something in the looks or smell of a white man which the carabao doesn't like.

Once I sat for hours beside a pool, where carabaos lay half-submerged in a cooling siesta, waiting for the beasts to lumber out, so that I might photograph them. Once or twice I threw clods and yelled, trying to make them come ashore. But, with their sweeping horns and black faces level with the water, they only stared and emitted long, sighing grunts. Finally, in despair, I "shot" an ancient winebibber who came along the path, carrying two jars of the palm wine which Bali drinks when it "throws a party." (See Color Plate VII.)

Odd drippings of gum, looking like icicles, hung from a tree beside the path, as I walked back to the village, and from a wayside pool several girls, interrupted at their afternoon bath, scrambled out and ran away, carrying their scant sarongs, at my approach. "Wing shooting," so to speak, would have been my only chance for a picture here; but autochromes are not adapted to moving subjects.

Such butterflies as one sees in Bali! Orange and white, black and yellow, or black and green, and huge purple ones, all flying like birds, not fluttering, as ours do. And there were wild chickens in the woods, the cocks brilliantly colored, and a talking bird they call the beo, a black, sluggish fowl with dangling yellow wattles—an ugly thing, like a wattled old woman.

THE PIGS OF BALI ARE CURIOSITIES

The Bali village is a group of kampongs or compounds. Each surrounds several little houses and a few smaller structures used as granaries and built high to save the grain from pigs and rats. One house may shelter several families. Usually the Bali hut itself is a small, nipalike, thatched affair, with a frame of poles. A few feet above the ground is a platform, where one sees the family lying around at ease during much of the day. But whenever I approached one of these family groups with my camera, the members of the household would roll off the platforms and sidle over to the next house.

The Bali pig is a physical curiosity—like a dachshund with a pig's make-up. Even in infancy his tummy almost drags on the ground. In youth he has no youthful figure. He is "underslung," so to speak, and could never travel a road with "high centers." The older he gets, the bigger his waistline. And his back sags like that of an old family nag ridden when too young.

Bali, too, is the land of big noise. There's no brawling, but if it isn't the native orchestra, it is the roosters that keep up the racket. They crow by the thousands, long before day. Before they quit, the pigs begin to squeal—not from hunger, for they're all fat. Foraging in the cool of the morning or lying in midday shade, I heard them testing their squealers. They seem to want to tell the world that here no Moslem prejudice against pork can cramp any pig's style or restrain him from self-expression.

I saw these Bali pigs, each in his own wicker cage like a prize bird, being loaded on ship for export to Singapore. The deck was piled five tiers high with the fat, waddling creatures, whose squealing chorus almost drowned out the ship's siren.

Here pork is the only meat eaten. Cattle are raised, but for export. Big, brown, beautiful creatures they are, with a singular white patch on their hind quarters. Seen from behind, they look as if they were wearing white pants. I was told that at times the bulls figure in a religious ceremony and are decorated with big bells, but I saw none of this.

GRACEFUL WALKERS BEAR HEAVY BURDENS ON THEIR HEADS

Everywhere I met streams of people walking, walking—and always carrying something on their heads. If it wasn't a half-nude girl with a 50-pound temple offering of fruit and flowers balanced on her head (see Color Plate I) it was a small boy balancing an empty bottle there, or a man with a bundle of sugar cane, a basket of rice, or coconuts, heavy enough to make any union porter in America rub his shoulder and ask for another two bits.

During the years when I painted, I knew many famous models in American and European art centers, but I recall few specimens of the human race so easy to look at as the beautiful women of Bali. Erect, slender-limbed, small of wrist and ankle, with tapering fingers, and long, wavy tresses falling over a smooth skin nearly white or light bronze; with perfect, even teeth and a singular grace and dignity of carriage, they have few physical equals among womankind.

A BALINESE DRAMA IS CHIEFLY SPECTACLE

Strolling one afternoon through a shady coconut grove, I heard the marimbalike rumble of the gamelan, or native orchestra (see Color Plate III). Guided by its hollow drumbeats, I came presently upon a crowd of natives squatting about the sylvan stage of an open-air theater.

Though the girl players' words were as Comanche to me, from their gestures and pantomime I caught at bits of plot in this Balinese drama.

But it was the spectacle itself—the gorgeous golden gowns and ornate headdress of the Bali showgirls, the graceful, symbolic measures and postures of their ancient dance—that enthralled me. The training of these girls begins at the age of five; at 12 or 14 they cease dancing and return to village life.

Here the play's the thing, and all over the island the drama and the dance go on throughout the year. But a playwright would starve; and no "new steps" are ever introduced by Bali dancing girls. Here there's never a "first night" nor a new show. To-day Bali enjoys the same songs, dances, and drama it knew centuries ago, all based on island folklore, mythology, and historical legends. Yet nobody seems bored. Even the children know the lines and songs by heart; they follow the players' every word and gesture with close attention.

Such demons as ruin the rice crops or bring disease to carabao, and the demigods who have influenced the lives of the Balinese through the centuries, figure in the songs and drama.

Shows are usually given in the daytime, against a temple or a natural back drop of jungle green.

When one performance was over, my interpreter sought the headman of the near-by village where the dancing girls

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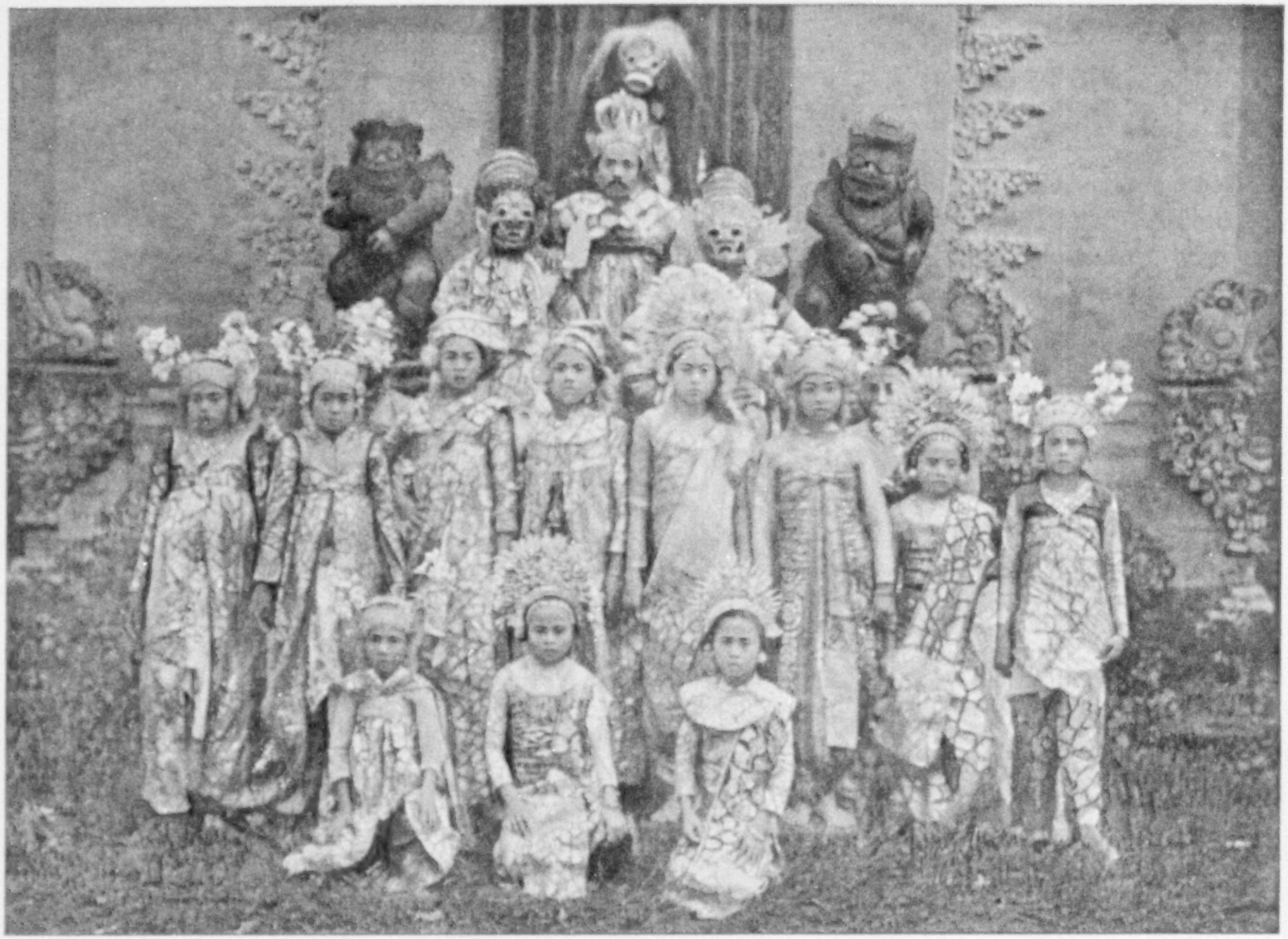
FOOD FOR THE GODS IN BALI

Suggestive of a Chinese New Year's cake—or the stage crown of a musical comedy king—these Bali Island temple offerings of fruits and flowers are gorgeous to look upon. These gifts frequently weigh from 50 to 125 pounds. Yet the strong, straight-backed Bali maidens easily carry them on their heads, walking five or ten miles along bamboo-shaded jungle paths to reach a favorite temple.



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WITH DANCE AND SOUNDING BRASS THE BALINESE PRAISE THEIR GODS

In gold-leaf gowns and ornate crowns, Bali dancing girls perform their rhythmic steps. Here most dancing is still a form of religious expression. Flanked by two grinning idols in the rear rank, stand the masked priests, who trained the girls. Among them, with mustache and regal bridelike finery, is the village headman who staged the dance for the photographer.

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DRUMS AND XYLOPHONE-LIKE INSTRUMENTS COMPOSE THIS BALI ORCHESTRA

On a still night, the thump and murmur of the *gamelan*, as the band of from 10 to 17 men is called, may be heard for an astonishing distance, through the hushed jungle lanes.

TWO DANCING STARS OF BALI

In step, time and posture, the Bali dances resemble somewhat those of Siam and Cambodia. Almost from infancy, the girls are rigorously trained, and they usually retire to village life after the age of 12. The average religious dance lasts from 40 to 50 minutes.

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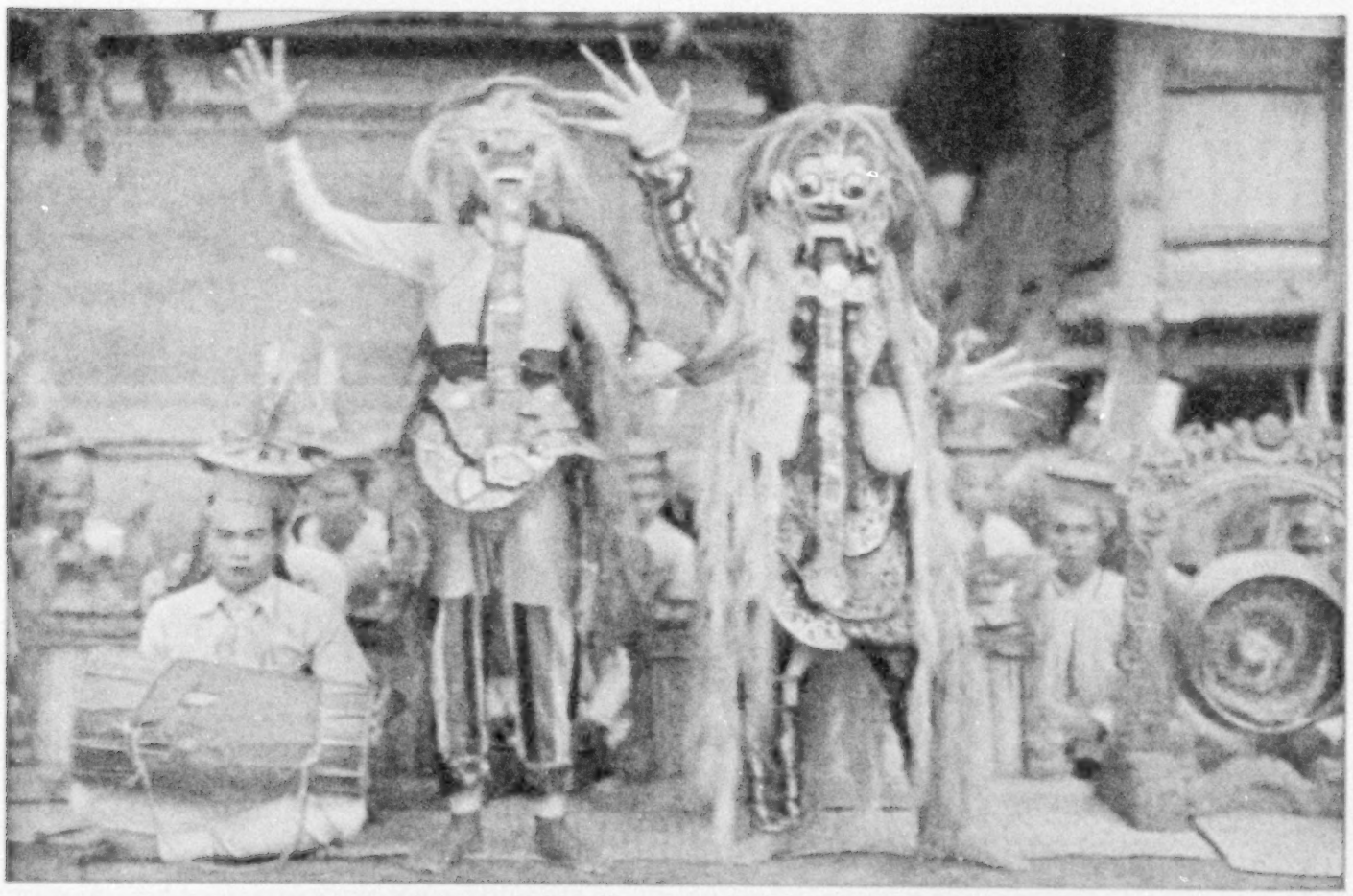
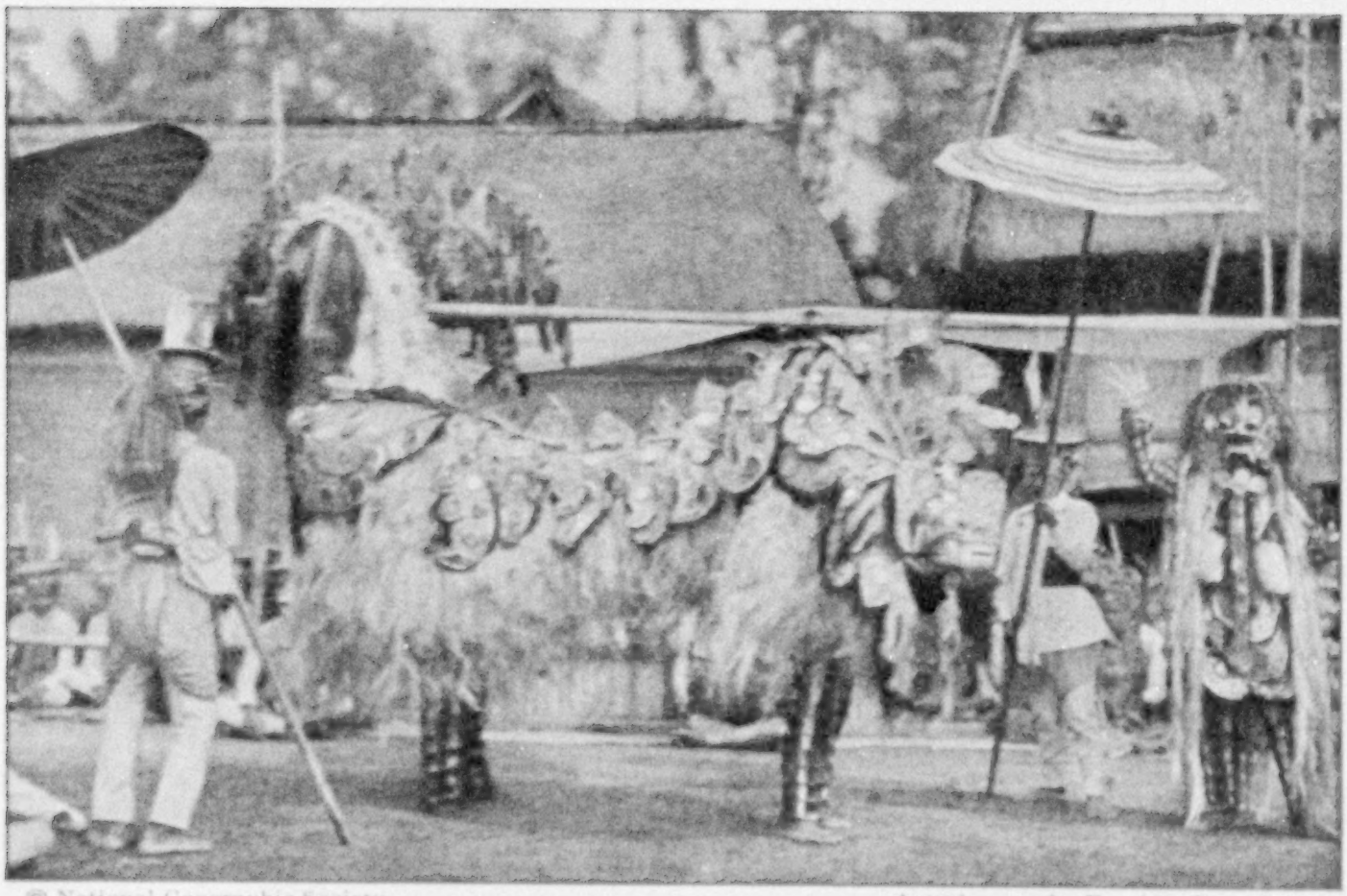
BALI HAS NO BLONDES

These 17 girls, chosen at random without regard for caste, from a near-by village, are average examples of Bali's erect, well-formed womanhood. They are of a light bronze color, and have straight or wavy dark hair.



COSTUMED FOR THE SACRED LION DANCE

The priest on the right might well be signaling for a manicure. Long finger nails are worn by some of Bali's holy men. With these long nails, and their supple wrists and fingers, they form strange geometric figures in the air as they sit cross-legged at their prayers.



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A LION, AS CONCEIVED BY BALI ARTISTS

The Balinese take their ceremonial Lion Dance quite seriously. Supported by two priests, the effigy is made to wiggle its false tail, shake its mane, and cavort grotesquely about on its paws of bare human feet.

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A YOUNG BALI ACTRESS, MADE UP AS A CROSS-EYED BOY

This child performer is the most accomplished actress on the island. Here, with the golden kris, turban and hand-woven gown covered with gold leaf, she is costumed for a male warrior rôle in a popular mythological play.

BRINGING IN THE SHEAVES

Young green rice in the foreground, a standing crop beyond the man, and harvested rice sheaves on his shoulder, form a composite picture of this valuable grain in three stages.

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BALI'S CHIEF BEVERAGE IS PALM WINE

In all island markets, this bitter, potent drink is sold by the cupful, from earthen pots such as these. Yet on Bali one seldom sees a drunken man. The island's most harmful vice is the abuse of opium.

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THE FACES OF PAGAN GODS ARE USUALLY CRUEL AND UGLY

Masks worn by the two priests are copies of the faces of graven images found in Bali temples. Foreign artists visiting this island are amazed at the originality of design revealed in some of these grotesque, sculptured idols.

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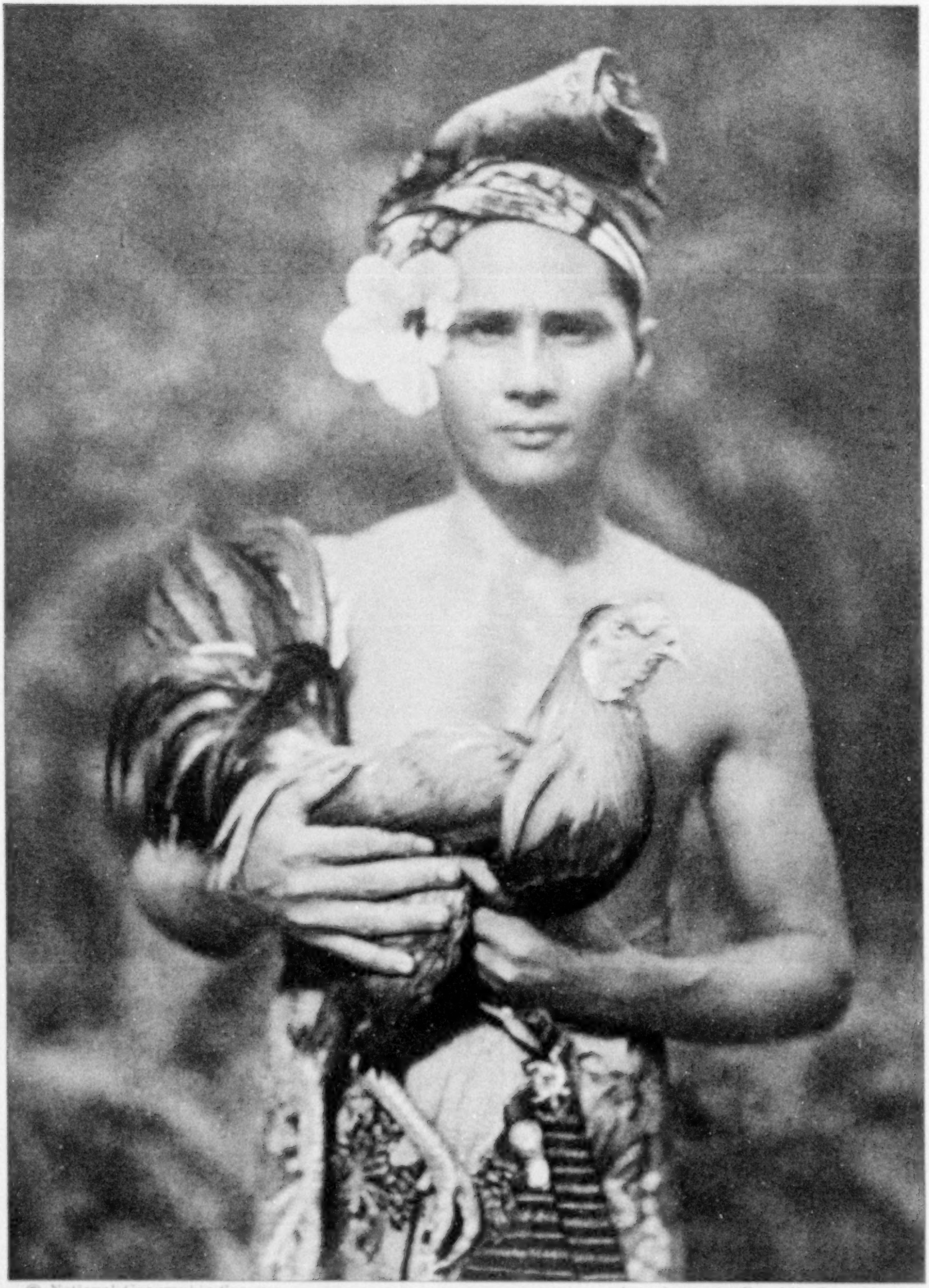
JUNGLE MAIDS IN REGAL FINERY

Ordinarily, village children romp half naked around the shady paths and pools of their island home. Only on fête days do they don these gowns and crowns to participate in the ancient ceremonials (see also Color Plates II and IV).



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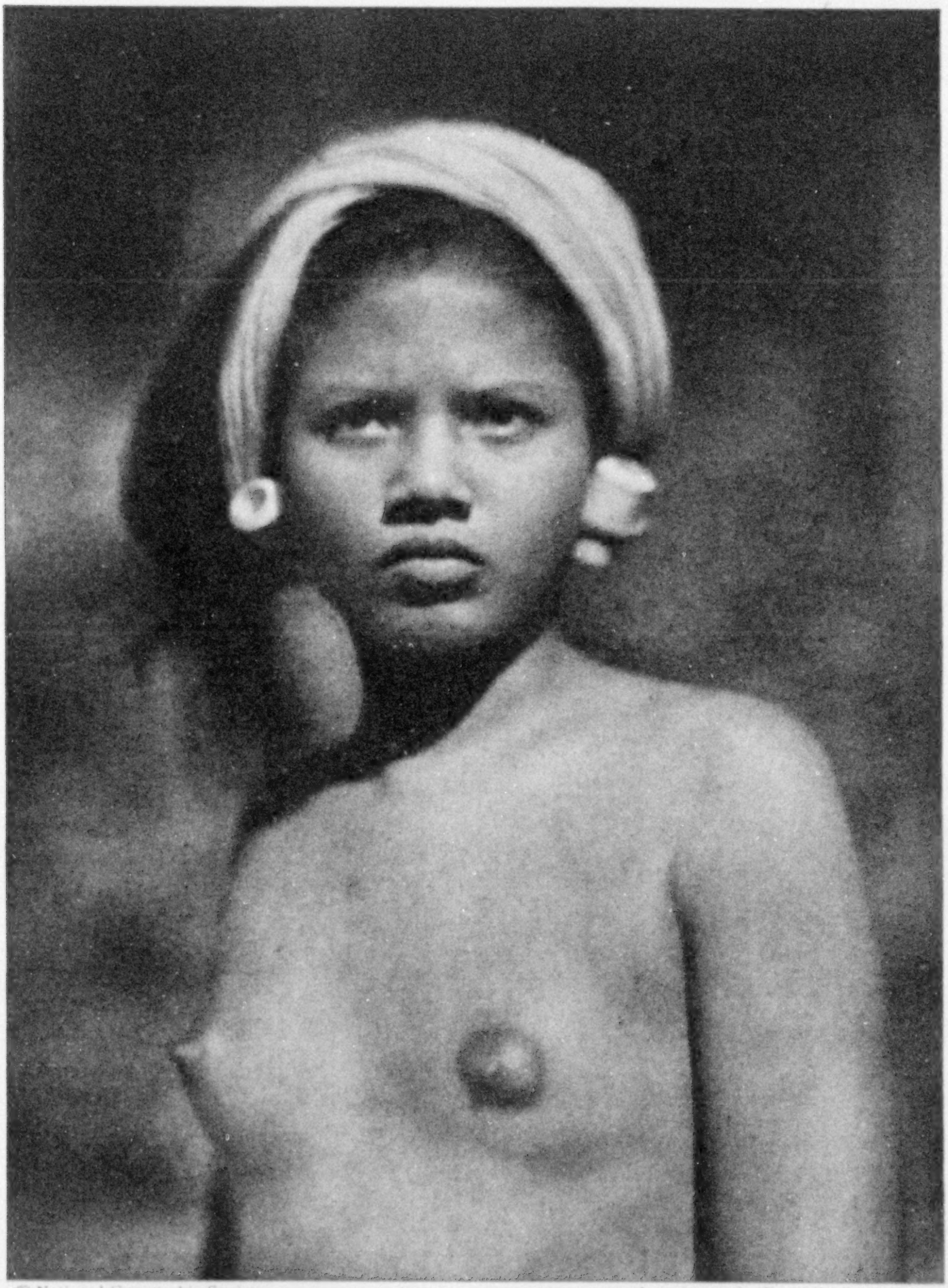
COCKFIGHTING IS A FAVORITE DIVERSION WITH THE TIRED BUSINESS MAN OF BALI
(SEE ALSO COLOR PLATE XIII)



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EVEN THE CAMERA COULDN'T COAX A SMILE FROM THIS RESERVED AND DIGNIFIED DAUGHTER OF THE EAST

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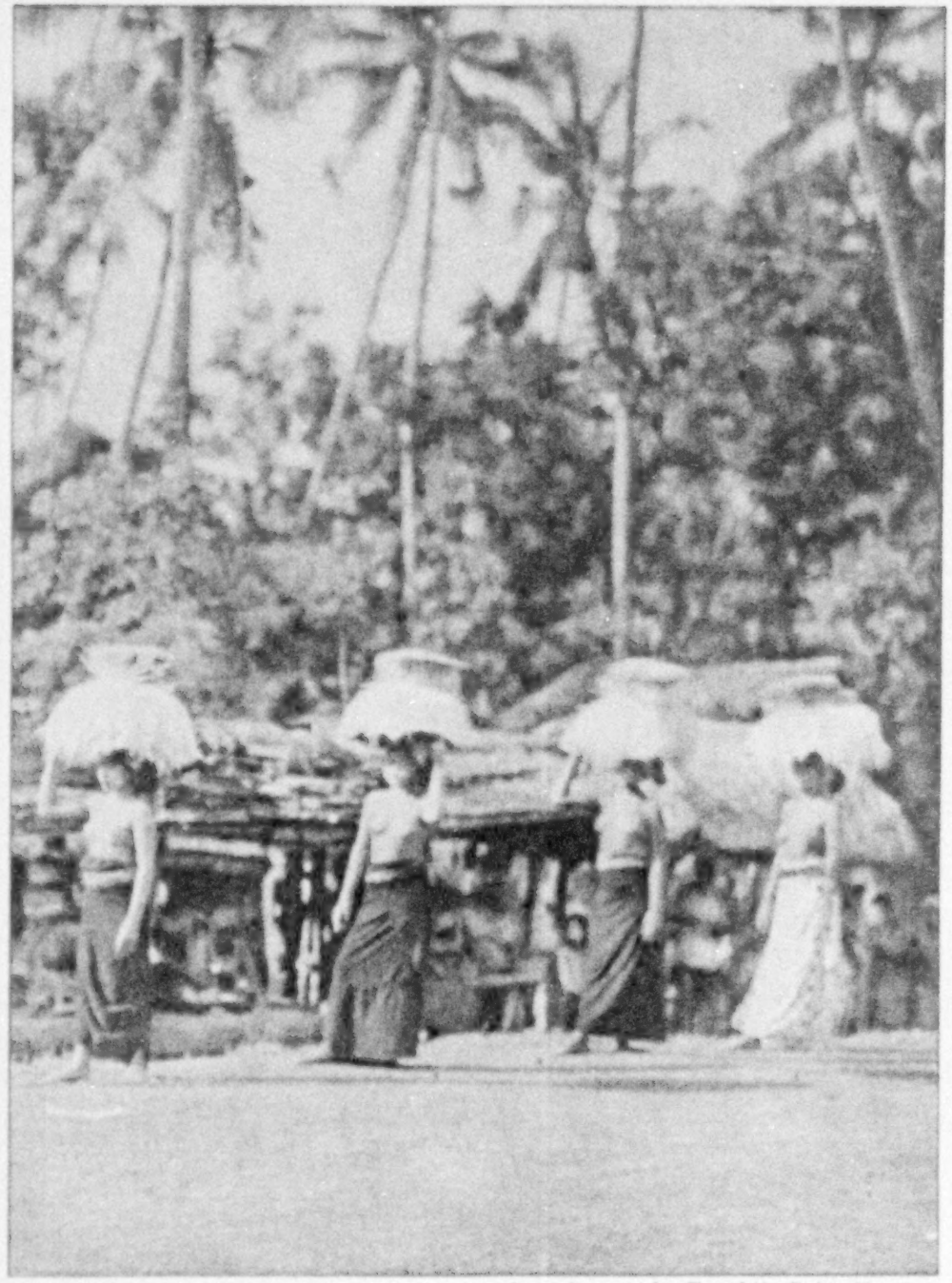
ONCE BALI MADE ALL ITS OWN SARONGS; NOW, CHEAP ONES ARE IMPORTED FROM EUROPE

Formerly this simple piece of cloth, in beautiful designs, was the only garment worn on the island. Now, with the encroachment of civilization, shirts, jackets and even shoes are beginning to appear.



Autochromes by Franklin Price Knott

LIFE IS SIMPLE ON BALI, AS IT WAS IN EDEN AFTER ADAM AND EVE WENT TO WORK

The island knows no fancy package foods, no delivery wagons or community grocers—just a well organized farming system where both sexes labor to provide food.

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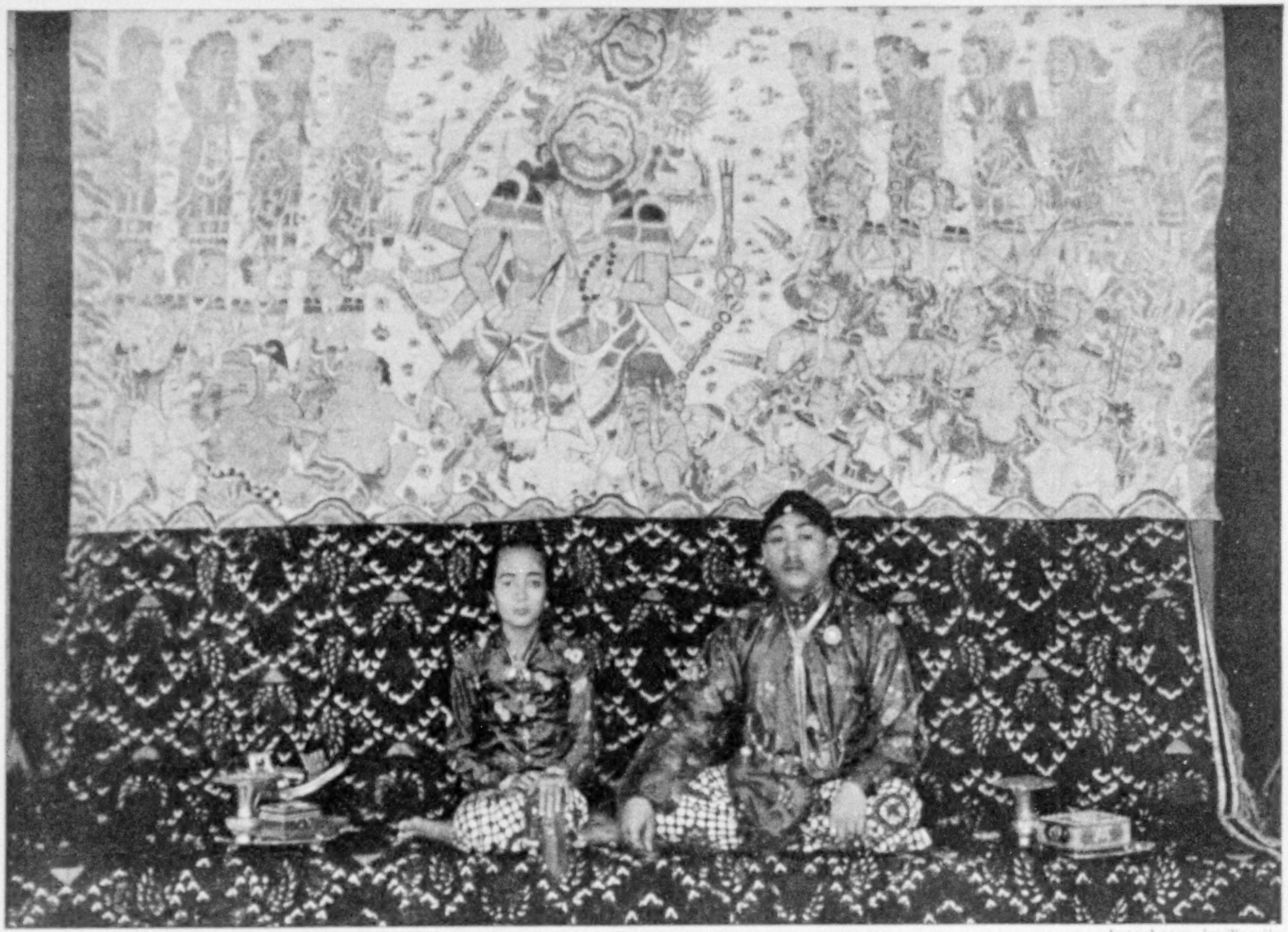
Autochrome by Franklin Price Knott

THE NATIONAL SPORT

Next to his children, a fighting rooster with many victories to his credit is the most prized possession of the Balinese. Snug in their neat wooden cages, these birds are carried proudly about the village streets by their owners. When one favorite is pitted against another, the betting is very lively.



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Autochrome by Tassilo Adam

THE JAVANESE PRINCE, MANGKU NEGORO VII, AND HIS CONSORT, RATU TIMOR, OF SURAKARTA, JAVA

Though now differing widely from the Javanese in many ways, the culture and religion of Bali, like that of its larger island neighbor, came originally from the Hindus.

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Autochrome by Tassilo Adam

A SCHOOL IN EMBROIDERY

Eventually, no doubt, the Dutch who control Bali will introduce and develop industries here, as they have in other parts of the Dutch East Indies. This school was started by the native wife of a Dutch official of western Sumatra. She stands at the left.

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THIS 9-YEAR-OLD GIRL IS BALI'S CLEVEREST DANCER

Under her gilded crown, with her ornamental fan and gown of gold leaf hammered on silk, she stands for fashion's ultimate expression among the juvenile entertainers of her show-loving island.

lived. He agreed to have them pose in costume for me next day (see Color Plates II and IV).

RELIGION PLAYS A MAJOR RÔLE IN THE LIFE OF BALI

Hindu temples, big and little, cover this thickly inhabited island. Moslem immigrants have come over from Java, of course, and I saw many Chinese proprietors of shops where even American-made hand sewing machines were on sale; but I could not see that either Cross or Crescent had gained much foothold on Bali. One singular story is told of an early Christian missionary who, after long efforts, finally made one Bali convert. But this native apostate, thus cut off from his kind, finally turned on the missionary who had made him a social outcaste and killed him.

Even the most humble hut usually has its own little "house temple"—a crude, primitive structure of wood and thatch, with its simple offerings of cut flowers and rice.

Religion is everywhere in Bali. It seems to inspire all work and play. I saw no one who seemed lonely; no beggars, no drunkards, no prostitutes. Every act is service to the temple gods; every spot is holy, and every peaceful hour seems sanctified to daily life. Here the external and spiritual world are closely akin.

No hill, no stretch of beach, no lake or river, no farm or forest, no hut or village did I see without its temples.

In the prettiest spot on every little farm patch stands the family altar, usually shaded by trees or plants. Here the farmer builds the wood or stone altars to the gods of his choice. Should a man's prayers go unanswered, he is quite justified in demolishing his existing altars and building new ones to a new divinity.

THE PRIESTS WORSHIP WITH THEIR HANDS

The strangest sight on my whole round-the-world trip was the aspect of the long-nailed, supple-fingered Bali priest (see Color Plate V). Sitting in the temple amid fragrant cut flowers, every part of his body rigid and motionless except his hands, the priest moves these in odd but graceful manner, making in the air various perfect geometrical figures, while chanting prayers. Amazing in their accuracy, these geometric figures were, and swiftly made by putting the extended thumbs, bent wrists, and spread fingers into different positions. But nobody could tell me what the figures meant.

Incense, holy water, a string of beads like a rosary, a little bell and the strange hand movements are all a part of the rites of the Bali priest.

One hears that once the cultured castes of this Hinduized island spent hours every day reading the history, theology, and poetry of Indian literature.

Much dancing there was and masque and puppet plays, but I didn't see anybody reading.

John and I sat through one performance at a temple, where the drum and gong orchestra went on for hours. "What are the actresses saying?" I asked. But the interpreter couldn't tell me, for the talk was not in everyday Bali words, but in the old sacred, or Kawi, tongue, interspersed with Sanskrit words.

THE TEMPORAL POWER OF BALI'S PRIESTS HAS ENDED

The priests keep the books of big tree leaves and "fish-worm" writing; they know the old languages, the significance of mysterious geometric figures in the air (see Color Plate V). And rajahs wear the jewel-hilted kris. But the wings of both are clipped, for although religion, as the only Bali American said, is the island's chief occupation, the temporal power of priests is gone; and so is despotic rajah rule. Now the superpower is the Dutch governor, living at Singaradja. Once the peasants had to throw themselves flat on their faces in the dust or mud whenever they met a rajah or a man of higher caste. Not now.

Although in theory Dutch rule doesn't tamper with old caste laws, with the passing of the rajahs and the obeisance they exacted, the social organization tends to change. Under old island laws, for example, if a high-caste girl married beneath her station, the people used to catch her and burn her and put her plebeian husband in a sack and throw him into the sea. To-day, of course, the Dutch forbid this. So love now defies caste.

During my month's visit I made my headquarters at Den Pasar, near the southern point of Bali. There I took a small house, built by one of the hundred Dutchmen on the island. From Den Pasar roads lead off northwest and to the eastern shore of the island. The desert-like western half has no roads and is practically uninhabited.

Although it is only from 15 to 50 miles from north to south and 93 miles from east to west, in early times the island was divided into small kingdoms, and these were almost constantly at war. But now only one native ruler, the Rajah of Karang Asem, remains in power. He is semi-independent and nominally holds sway over about 160,000 subjects.

Under the Dutch a few members of old native royal families hold positions of local authority. They administer native laws with the aid of a few constabulary.

The only disorder I saw on the island, which set a whole village roaring with laughter, was when two market women fought over a fish!

About the time America battled for independence, Dutch slave traders were busy on Bali. In 1778 13,000 Balinese were sent to Batavia and forced to join the Dutch army. When the English began to take an interest in the island, the Dutch built forts on the Java side of Bali Strait and bid for the rajahs' support. In 1839 fear of English aggression led the Dutch to obtain from the Bali princes a recognition of Dutch supremacy, but without right of interference in the island's internal affairs.

PLUNDERING OF WRECKED SHIPS COST BALI ITS INDEPENDENCE

It was the "Tawan Karang," or "shore right," which finally led to fighting between the Dutch from Java and the princes of Bali. This Tawan Karang was a right claimed by the Balinese—the right to plunder any foreign ship which went ashore on Bali or was in distress in its waters. As late as 1904 this right was exercised and the Dutch defied.

Off and on for nearly 100 years, the Dutch quarreled with the Balinese and many a rajah was slain. More than once a rajah and his whole family committed suicide rather than be deported or submit to Dutch rule.

To-day Bali is peaceful. The Tawan Karang and slavery are abolished and the opium trade is fairly well controlled.

BALI'S IRRIGATION SYSTEM REFLECTS GREAT ENGINEERING SKILL

No region on earth is more highly cultivated than the tillable parts of Bali. Here irrigation is applied to its utmost refinement. In building reservoirs, or *waduks*, in laying out and digging canals and laterals, the Balinese are among the world's most skillful engineers. So highly was their system developed that when Dutch engineers came they had nothing to add.

On Bali, as in the United States, irrigation districts are set up. Each controls its own water supply, and water rights are equitably distributed. It also regulates land transfers and holdings. The planting of crops, the tending of cattle, and collection of rates are all supervised by these coöperative associations.

Rice is the chief food, but wheat, copra, groundnuts, tobacco, fruit, and onions are also grown. Cattle, hides and horns, and swine are exported. For its soap, crude hardware, tools, and a limited amount of cloth and clothing, Bali depends on imports handled by Chinese and Dutch traders; but, to a singular degree, the island is a self-contained garden of Eden, where life is easy and food plentiful.

Swift and sweeping as change is in our modern, inventive world, Bali responds but slowly. Here the well-dressed young man and everybody else need wear only the sarong—a multi-colored strip of batik, about a yard wide, wound around the waist and hanging to the knees (see Color Plate XII). Till cheap factory-made sarongs came from Europe, these simple garments were works of art, for at weaving, as at carving and in the fabrication of objects of gold and silver, the Balinese are skillful. Only on entering the temples must women cover the upper part of their bodies. For this they use a light scarf.

When one stops to think that Bali, with its singular charms, is only a night's run from the tourist path through Soerabaya,

one wonders that irresistible civilization has not already upset its primitive life.

Of course, modernism is bound soon to sweep this primitive isle. I saw one upper-caste native girl, in complete European dress, drive a motor car up to a temple, get out with her offering of fruit and flowers, and follow the line of barefooted village women into the pagan house of worship with its frangipani trees and grotesque carven figures.

Already, as at Buleleng, on the north shore, the commonplace galvanized-iron roof of the white man's tropic conquest is lifting up its ugliness, and bicycles make tracks on sandy beaches. A few automobiles have come; hotels may soon be built, for tourists are beginning to ask, "Where is this trick island of Bali?"

The Dutch are founding schools, and already Bali has heard that the printing press is easier and faster than the old native method of writing with "fish-worm" letters on the broad paperlike leaves of a tree.

Some Bali boys have gone to Java to schools and two American composers are going to Bali to write its music, which is like ours, except the "la" of our do-re-mi is missing; and a well-known tourist agency considers routing its around-the-world cruises via Bali.

FAREWELL TO THE ENCHANTED ISLE

It was the last day of my visit. Late in the afternoon I came to Sangsit, on a fine road that leads along Bali's north shore. Here yet another temple! Singular structures they are, ornately carved and more like open courtyards than roofed houses. At each side of the main entrance stand pyramidlike posts covered with odd carvings. Walls make the temple inclosure, over which there is no roof but the sky. Inside this compound, however, are little platforms and they are roofed over. Here the people put their offerings.

Horribly hewn faces and fierce grotesques cover the walls and balustrades. Often they are strangely like the old Maori carvings. One hideous mask always has his tongue stuck out. Other handmade gods have two big tusks, one in the upper and one in the lower jaw, which extend over the lips. In all lands where tigers eat people, I was told, this long-fanged god is a symbol of superpower.

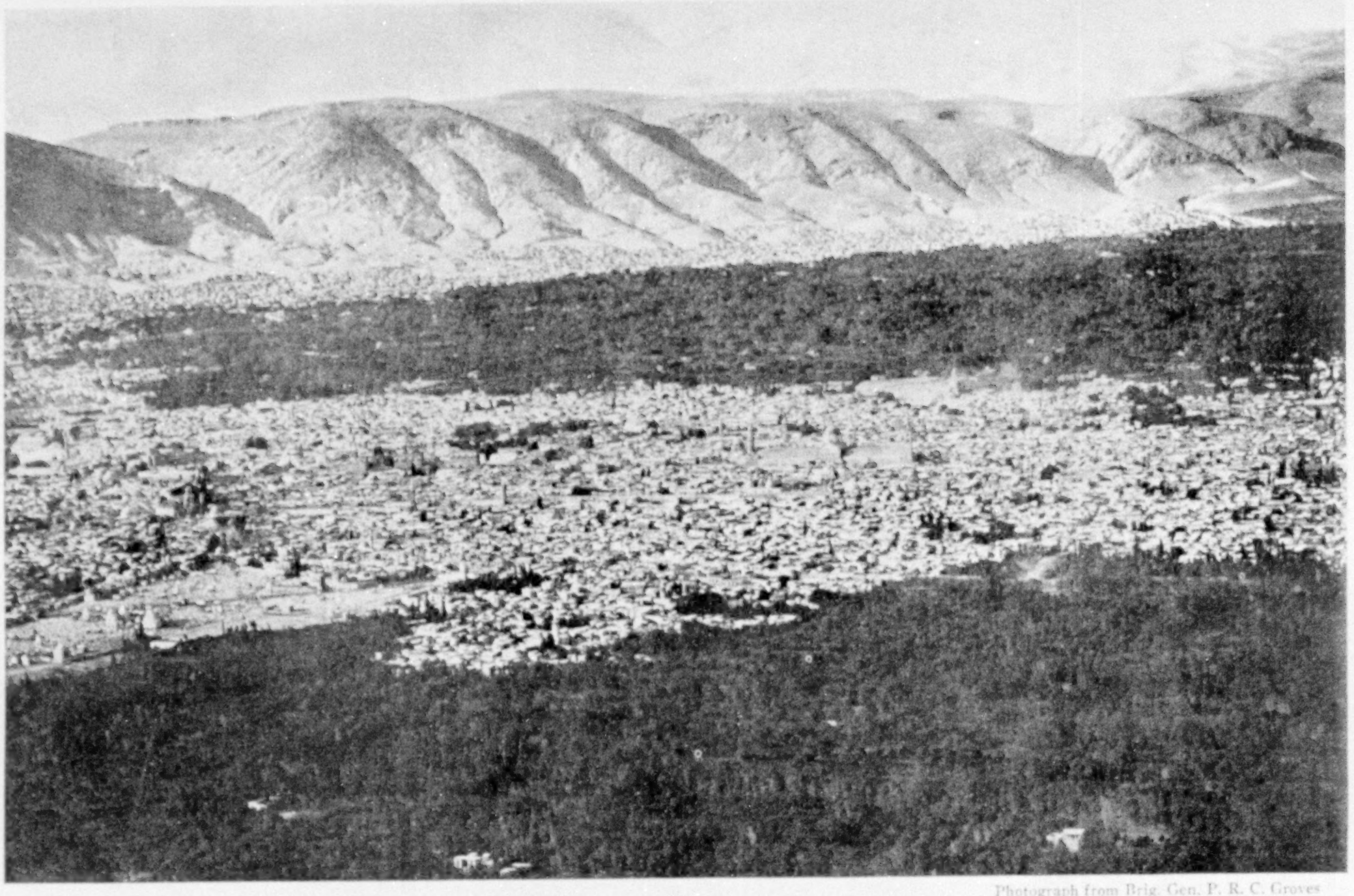
On the beach at Buleleng I told John good-bye. Again the file of dogs, each intent on his own affairs. Turbaned, absent-minded men and women walking, walking, burdens on head, and all ignoring me—all minding their own business.

A heavy surf ran. To reach the ship's boat, one had to wade out. I wrapped my precious autochrome plates in my raincoat and held them on my head to keep them dry and waded waist-deep against incoming breakers.

As we rowed out to the ship, I looked back for the last time at Bali—at the file of erect, statuesque women walking. A lull in the noise of the surf, and on the breeze came again the echoing drumbeats of the gamelan, the squealing pig-song, and the hypocritical crow and cackle of pretentious poultry. And through the tropic dusk a lone ibis winged his way. . . . I want to go back.

"THE DISCOVERER," WITH THIS NUMBER OF THE NATIONAL GEOGRAPHIC MAGAZINE

MR. N. C. WYETH has recently completed for the headquarters of the National Geographic Society in Washington a series of five mural paintings depicting the Romance of Discovery. The first of the group, "The Discoverer," is reproduced as a special supplement with this number of the NATIONAL GEOGRAPHIC MAGAZINE. A limited edition of the supplement has been printed on special art paper and will be mailed, unfolded, at $1.00 each, to members who desire to frame it.



Photograph from Brig. Gen. P. R. C. Groves

LOOKING DOWN 4,000 FEET UPON THE WHITE CITY OF DAMASCUS, PEARL OF THE ORIENT

Backed by bare, chocolate-colored, lime-streaked mountains, this oriental jewel lifts pink roofs above the emerald sea of surrounding orchards. One of the oldest, if not the oldest, of the world's inhabited cities, Damascus is thoroughly Mohammedan. Its luscious fruits make it "the paradise on earth" for which the Prophet sighed, and have caused it to be extravagantly extolled by the poets of the sterile Arabian peninsula.

SEEING THE WORLD FROM THE AIR

By Sir Alan J. Cobham

IN THE course of my work during the past five or six years I have seen many parts of the world.

My wanderings have taken me over every capital in Europe and over the length and breadth of the great African continent.

More than once I have traveled over the great Syrian Desert to India, Burma and back, and only recently I journeyed all the way to Australia and return via Rangoon, Singapore, and the Dutch East Indies.

Yet with all these wanderings it was not until a few months ago that I made my first steamship voyage, when I crossed from Southampton to New York.

Hitherto my journeys had been made in the air, and my mode of transport was an airplane or seaplane, and when I reflect on my various exploits, somehow I feel that my memories and impressions of the countries I have visited are far more vivid and realistic than are the memories of the individual who has traveled by steamship, train, or motor car.

STUDYING ARCHEOLOGY BY AIR

Early in 1923 I made a circular tour, covering about 12,000 miles, over Europe, Egypt, Palestine, Algeria, Morocco, and Spain. My passenger was an old friend, whose greatest hobbies were travel and the study of ancient civilizations.

We had flown many thousands of miles together on previous occasions, but this trip was a little more ambitious. From London we flew to Paris, through France, along the Riviera coast line, across Italy to Greece, and then over the Mediterranean to Africa and Egypt.

Then, for the first time in history, we flew across the whole breadth of Africa, from Egypt to Morocco, after which we crossed the Strait of Gibraltar and by way of Spain and France returned to London.

My passenger was an enthusiast about traveling by air, for to him there was no more delightful way of seeing the countries whose history he had studied. Thus, on our flight from Brindisi, at the heel of Italy, over the Adriatic to the island of Corfu, and down the mountainous coast of Greece, through the Gulf of Patras and the Gulf of Corinth to Athens, he was able to see spread beneath him the scenes of Greek mythology and of Greek and Roman history that he had read about since his youth.

THE HOP FROM EUROPE TO AFRICA

Our first view of Athens and the famous Acropolis was from the air (see page 357). After a few days in the town, during which we visited the Parthenon and the Stadium, the latter built on the site of the ancient Stadium where the Greeks of old held their Olympic games, we began to prepare for our flight across the Mediterranean.

One fine day we left Athens and flew out over the Ægean Sea; then over the island of Crete, where the first aviators were born. According to legend, their names were Dædalus and Icarus. Having made themselves wings of feathers, they fastened them on with wax and began their flight. Dædalus reached Sicily, but Icarus, exulting, flew too high, and as he neared the sun the heat melted his wings and he fell into the sea.

However, no such ill fortune befell us. We soon left snow-capped Mount Ida behind and then on a compass course headed for Sollum. We were nearly three hours out of sight of land, but at last the coast of Africa came into view and we discovered that we had hit our objective within one mile.

Sollum is an Egyptian frontier outpost on the edge of the desert. On the night of our arrival we were entertained by the resident officer, and the Governor of the Northwestern Egyptian territory was also a guest. The latter spoke of the difficulty of traveling about his desert domain, and said that in the morning he would have to start on a weary two-days' journey by car to Siwa.

On consulting a map, I discovered that Siwa was an oasis some 200 miles to the south, in the Libyan Desert.* I suggested

* See, also, "Crossing the Untraversed Libyan Desert," by A. M. Hassanein Bey, in the National Geographic Magazine for September, 1924.

Drawn by A. H. Bumstead

AIR ROUTES FLOWN BY THE AUTHOR OVER EUROPE, ASIA, AUSTRALIA, AND AFRICA

Sir Alan Cobham's wanderings by airplane have taken him over every capital in Europe and over the length and breadth of the African continent, as well as on one round-trip voyage from London to Australia (see page 349).

that he might fly there in a little over two hours. Readily he accepted the invitation.

We landed near Siwa on a gigantic salt-pan, the bottom of a dried-up salt lake, which was as smooth and level as a billiard table and made a perfect landing field (see page 359).

As soon as the machine had come to rest we discovered an Arab convoy with camels, which had been instructed by telephone to meet us. It was dark before we reached the village, so we had to wait until the morning to see the wonders of the Senussi stronghold. Before the World War, a European visited Siwa at the risk of getting his throat cut, but since the conquest of these people, in 1917, all is quite safe. In fact, we found a solitary British officer, with a guard of native troops, in complete control of affairs.

SIWA STANDS ON A ROCK IN THE SANDS

Until recently the whole oasis was afflicted with malaria, but in ten years un-

Photograph by Ad Astra-Aëro

FLYING OVER SNOW-CLAD SWISS PEAKS IS LIKE SAILING A SEA OF FROZEN BILLOWS

der British supervision this malady has been entirely stamped out. This was accomplished by requiring that every drop of stagnant water should be brushed or agitated twice a day, thus preventing the mosquito from breeding.

The desert in this part of the world is not sand, but hard, dry earth, in many places as level as a billiard table.

So, on the following day, after enjoying mint tea in an oriental garden with the local sheik, and before taking off from our natural airdrome for Matruh, I took a few palm leaves and swept on the surface of our landing ground—that is, I scratched on this dried earth—a huge circle, and then a big T, to mark the site for the benefit of future aviators arriving in Siwa. The governor told me that these marks would remain for at least 20 years, as it never rains at Siwa.

FROM THE AIR THE NILE VALLEY APPEARS A WIDE RIVER OF GREEN

At Matruh there was a beautiful lagoon, and here, according to some accounts, Antony and Cleopatra once had a villa.

After flying eastward for 300 miles along a barren coast, we came to a spot where the desert abruptly ceased, and in a few yards the land was a mass of rich cultivation: we had come to the boundaries of the great Nile Delta.

In time we descried two peaks on the horizon, and after a few minutes we could distinguish the angular shapes of the Pyramids of Giza. Farther on we could see more pyramids, and then we realized that we were in the land of the Pharaohs.

In flying over Egypt one soon comes to realize that the country is nothing more nor less than Nileland, and that without this great river the nation would not exist. When seen from an airplane at a great altitude, Egypt appears to be a gigantic river of green vegetation, winding its way through a vast desert land, and in the middle of this ribbon of vegetation are the glimmering waters of the Nile, flowing northward, the source of every atom of life in this ancient land.*

From Cairo we followed the Nile to Luxor, and before landing surveyed from

* See, also, "The Land of Egypt," by Alfred Pearce Dennis, in the NATIONAL GEOGRAPHIC MAGAZINE for March, 1926.

Photograph from Ernest Peterffy

"GETTING IT HOME BY SATURDAY NIGHT": A CORFU WASHERWOMAN

the air the Valley of the Kings, Thebes, and Karnak. Afterward we landed on a clearing on the edge of the near-by desert, and spent several days studying on the ground what we had seen from the air.

OVER THE VALLEY OF THE KINGS AND THE ASWAN DAM

Now the journey from Cairo to Luxor takes a whole day by train, but we had accomplished the trip with comparative ease in four hours.

Proceeding up the Nile, we passed over many ancient temples, including Esna and Edfu (see page 362), until we came to Elephantine Island, with the First Cataract and the great Aswan Dam beyond (see page 361). In the reservoir behind the dam we could see the submerged temples of Philæ, which, until the construction of the great dam, stood high and dry.

It was getting late in the year and the hot season was coming on, so we did not wish to run the risk of overheating our engine. We decided to start for Halfa very early in the morning, and soon after dawn we were in the air, flying over the great reservoir and following the Nile southward.

The river here flows through a deep, rock-walled valley. When the dam was constructed at this valley head, the waters were unable to escape over the desert, but were confined within the rocky walls, thus creating a reservoir nearly 200 miles long.

All the way along the upper reaches of the Nile we kept flying over ancient Egyptian temples, until at last we came to the world-famous Abu Simbel, a temple hewn out of the solid rock, with huge monolithic figures mounting guard at the entrance (see page 363). At the extreme end of this great cavern hall is an altar. There are no windows in the temple and the only sunlight enters by the doorway, which faces due east.

We flew on until we came to the Second Cataract, at Halfa; and then, after circling two or three times, we flew back to Aswan, having been in the air about five hours. We arrived at our hotel in time for a late breakfast—a striking contrast to the week required to make the trip by paddle steamer.

On our return trip to Cairo we were

Photograph from Ernest Peterffy

A MILKMAN OF CORFU

This method of delivering the beverage saves the cost of running a wagon, and, with the customer looking on, affords no chance to water the milk.

flying in the region of Abydos, when suddenly the motor began to falter, and I realized that I should have to come down immediately. For two or three miles on each side stretched irrigated fields crossed by deep ditches. It is almost impossible to land safely in such territory; so, with my engine missing badly, I pushed the nose of the machine down a little in order to keep up our flying speed, and headed for the edge of the desert.

We landed safely, but had not been on the ground two minutes when we were surrounded by scores of natives, who threatened to damage the machine in their efforts to get near it. Happily the village headman soon came on the scene, and when I appealed to him to keep his fellows off the wings, he straightway issued an order to his police assistants, who instantly attacked the crowd with their sticks in a most alarming fashion. I was rather disturbed lest the populace should imagine that it was my wish that they receive such severe chastisement, but later I noticed that they all seemed to take it as a joke (see page 364).

When the crowd was back at a safe distance and ropes had been erected around the machine, we set to work and repaired our broken valve spring, and, after spending the night with the governor of a town near by, we proceeded on our way the following morning, reaching Cairo in time for lunch.

A SHIP IN THE SANDS

While at Cairo we decided to make the trip up into Palestine. Taking off from Heliopolis airdrome, we headed along the eastern edge of the Nile Delta for the Mediterranean coast.* After a half hour's flight I was amazed, upon looking over the desert toward the east, to see a big steamship gliding slowly through the sand!

As I came nearer to the boat I could see the straight gleam of the waters of the Suez Canal, which, owing to my oblique angle of vision, had at first been obscured. My steamship was not passing over the sand, but floating on the waters of the canal (see page 365).

* See, also, "Flying Over Egypt, Sinai, and Palestine," by Brig. Gen. P. R. C. Groves, and Maj. J. R. McCrindle, in the NATIONAL GEOGRAPHIC MAGAZINE for September, 1926.

Photograph by Ewing Galloway

A MORNING CROWD IN THE MARKET PLACE OF CORFU

Famous since Homer's day for its fruits and its beauty, land on the Greek island of Corfu is leased to tenant farmers in perpetuity. Here olive trees 300 years old are still in bearing.

This was my first visit to Palestine, and, recalling certain parts of the Scriptures, I remembered how the Tribes of Israel had wandered from the desert up into a "land of milk and honey"; and it was interesting to see from the air how the country gradually changed from barren, sandy desert (see page 366) to scattered scrub, and from scattered scrub to sparse cultivation, until at last we reached the farmlands of Palestine. Even so, there were many barren tracts and stony places which could hardly be described as a "land flowing with milk and honey."

We flew over Jerusalem on Good Friday, with a Bible as a guidebook, and, after circling the city many times, we went down to Bethlehem, and from there over the valley of the Dead Sea, its bottom being 1,300 feet below sea level.

We wandered up the Jordan Valley to the Sea of Galilee, and then crossed over the hills to Nazareth, and so came back to our landing ground at Ramleh, below Jerusalem. Later we visited all these places on foot, but with a far better grasp of their physical relationship through having seen them first from the air.

SKIRTING THE SHORES OF NORTH AFRICA

On our homeward journey we flew back over our tracks as far as Sollum, and then over Tripolitania for several hundred miles to Benghazi.

In the time of the Romans the whole of this North Africa coast was a great wheat-growing region; to-day it is practically desert country, in which here and there Arabs raise a few sheep and goats. Year by year the Sahara has encroached and the winds have blown the sand over the arable lands until they have been virtually obliterated.

The flight from Benghazi to Misurata, on the opposite side of the Gulf of Sidra, was one which presented many hazards. It was a distance of nearly 500 miles; there was no possible opportunity to refuel, and the country was in the hands of the wild Senussi, with whom the Italians were at war.

Our Italian friends told us that they could not be held responsible for our safety if we were forced to land on this strip. If the Arabs caught us, they would certainly torture and mutilate our bodies, as they had done their soldiers in the past.

However, the trip had to be made, even though I had doubts as to whether I had sufficient gas capacity if heavy head winds were encountered.

With every tank full to the top and with as many tins of gasoline as we could pile on board, the machine was overloaded, but we had a good airdrome from which to take off, and so we managed to climb slowly into the air. The front cockpit was so filled up with tins of gas that Woodhams, my mechanic, had to kneel on the seat with his head down until such time as we could empty some of the gas into the main tanks.

REFUELING IN THE AIR

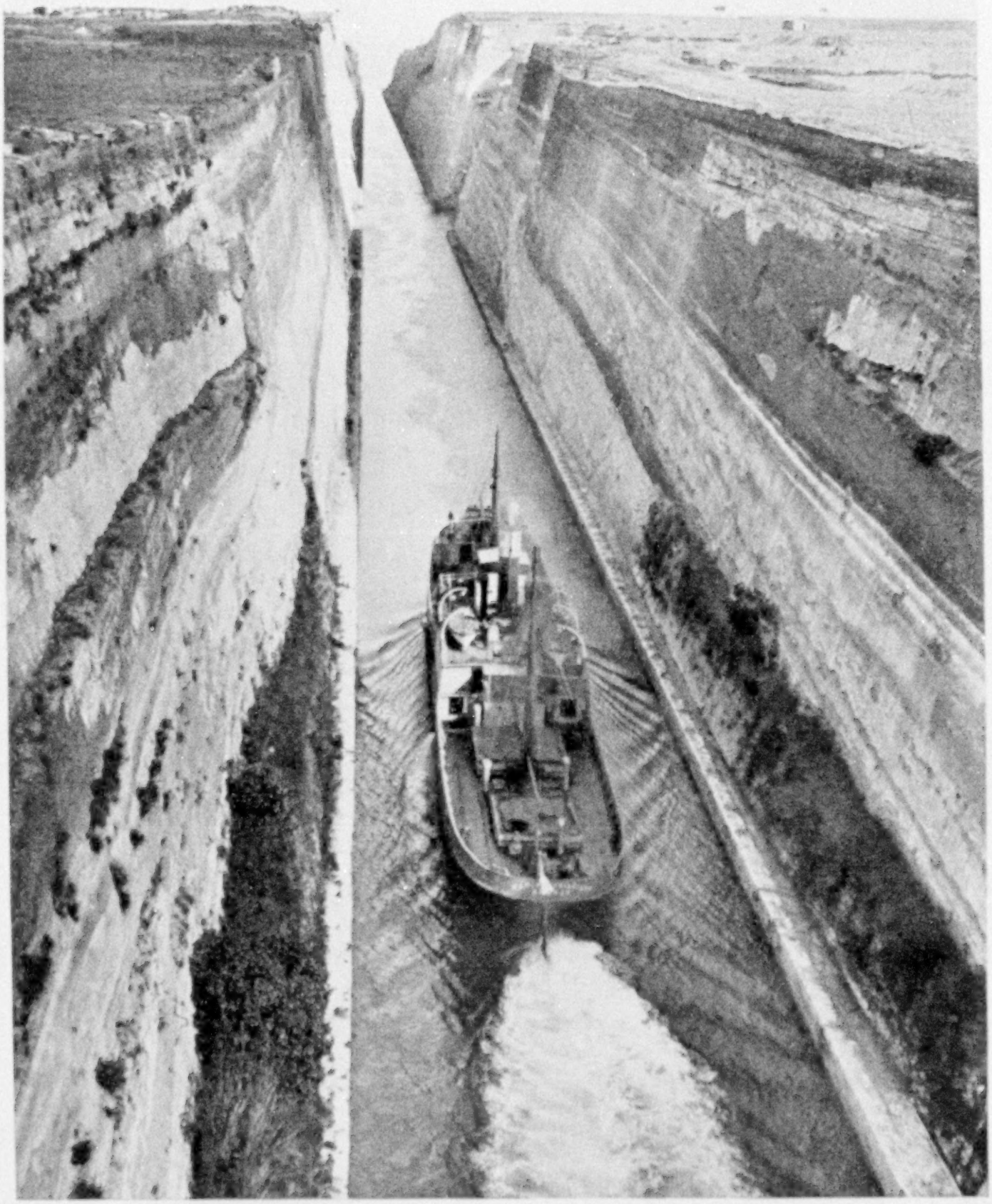
Before starting we soldered a small copper pipe in the top of each tin of gas and over this put a piece of rubber tubing which passed into a hole in our main tank, for we were going to refuel in the air.

After we had consumed four gallons of gas from our main tank, Woodhams set about his arduous task of emptying one of the tins down the rubber tube. He did this by holding the tin more or less above his head, notwithstanding the terrific force of the wind against it, while the gas ran down the rubber pipe. After the tin was emptied, he would stand up in his seat and throw it overboard with force, else the slipstream of the propeller and our forward speed would cause the can to collide with the tail of the machine.

Added to all these precautions against being forced to land in the enemy territory, we carried a letter, written in Arabic, which explained that we were not Italian soldiers, but harmless British civilians touring for pleasure, with no arms on board.

As it happened, we had a delightful, more or less uneventful flight to Misurata, and then proceeded to Tripoli, and so on to Sfax, in Tunisia.

There is not space to tell here of all our little adventures in Tunisia, Algeria, and Morocco, but about a week later we crossed the Strait of Gibraltar to Spain, intending to fly on to Granada. Owing to the very heavy rain and low clouds over the mountains, I decided that it would not be safe to continue in that direction, so proceeded toward Seville. As my pas-



Photograph by Ewing Galloway

NAVIGATING THE SWIFT WATERS OF THE CORINTH CANAL

More and more, in our complex commercial life, impatient man seeks short cuts for his cargoes. This Corinth Canal shortens the route from the Adriatic to Piræus, port of Athens, by about 200 miles. It was started 47 years ago by a French group and finished in 1893 by the Greeks. It is said that Nero, the fiddling emperor, started to dig a ditch along this same route, over which the ancients once dragged their ships.

Photograph by Sir Alan J. Cobham

LOOKING DOWN UPON THE ACROPOLIS AT ATHENS

In the center, the Parthenon, most perfect monument of antiquity, crowns the Acropolis. The area at the foot of the north side of the Acropolis is now the city's most dilapidated section, but was formerly the ancient center of Athenian life. In the background rises Mount Lycabettus, and to the right is the Royal Palace.

senger remarked, one of the delights of aërial touring is that you are never quite certain where you are going to turn up.

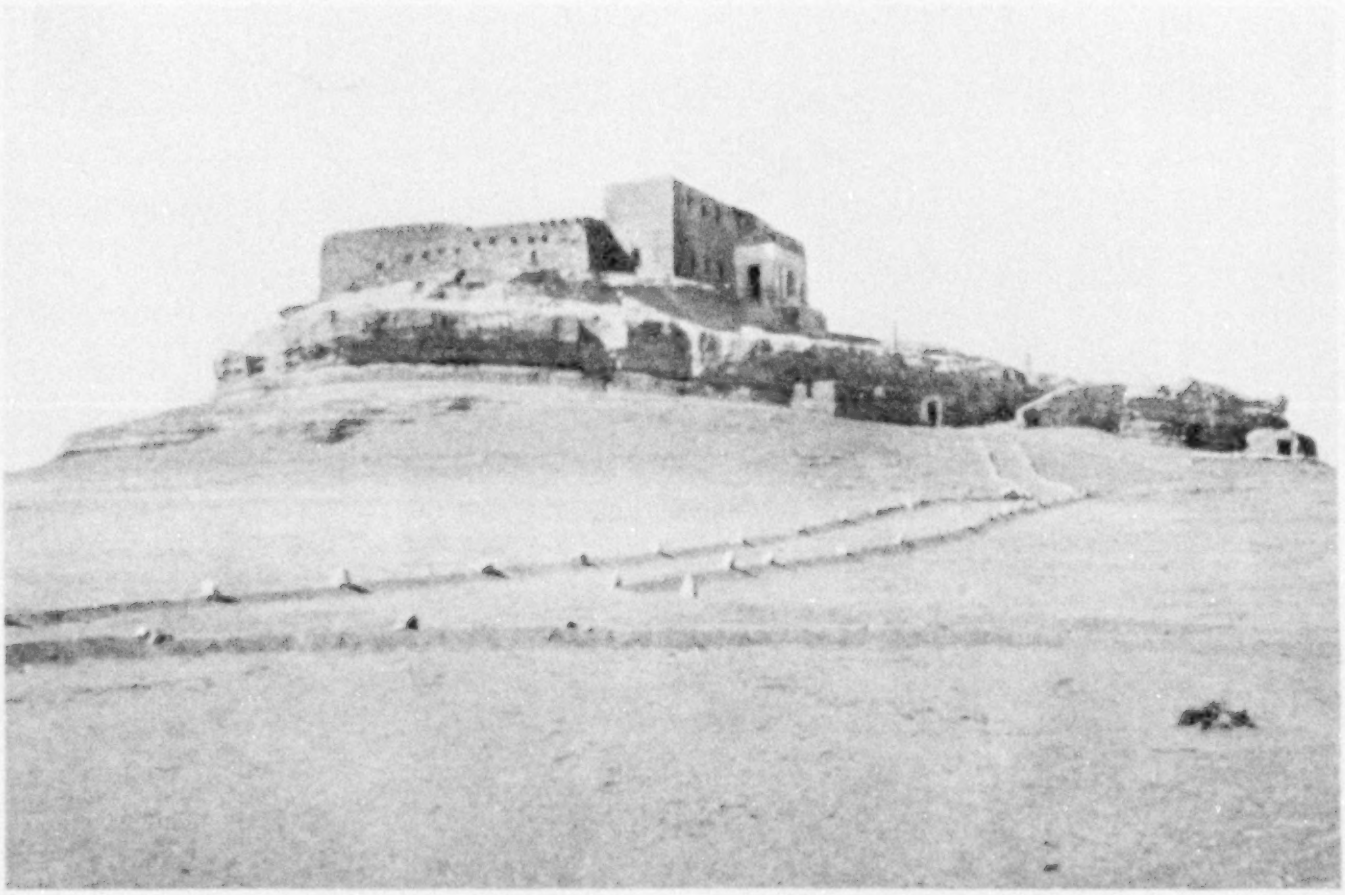
However, such experiences were rare, as we usually made our objective. We visited Granada two days later and wandered around the ancient Alhambra (see page 368).

PLANNING A FLIGHT TO INDIA

The final stage of our journey, from Madrid to London, was made in one day. We breakfasted in Madrid, had lunch in Bordeaux, sipped afternoon tea on the airdrome of Lympne, near Folkestone, and dined in London, thus completing with a wartime machine a tour of more than 12,000 miles without any preliminary organization or set route.

In the autumn of 1924, Air Vice-Marshal Sir Sefton Brancker had to make a journey to India in connection with the allotting of a port of call and the building of a mooring mast for the future airship service that may eventually run through to Australia.

As Director of British Civil Aviation, Sir Sefton Brancker maintained that he ought to fly to his destination; but the Treasury argued that Government officials should travel by the cheapest route, and as the cost of a special airplane to fly to India and back was far in excess of the cost of a first-class steamship passage and return, the Treasury could not see its way clear to grant the sum of money necessary. However, on learning that the aviation industry was willing to support



Photograph by Sir Alan J. Cobham

THE HEADQUARTERS OF THE BRITISH RESIDENT IN THE OASIS OF SIWA
(SEE TEXT, PAGE 350)

the flight, the Treasury became more lenient and a good portion of the expense of the journey was allotted.

The Director decided that, as we were going to fly to India, and possibly beyond to Rangoon, in Burma, he would make it a flight of survey and would endeavor to ascertain the best air route.

We had a depressing and tedious journey through Europe in the wintertime, for we left London in November, and it was not until the Persian Gulf was reached that we met the sunshine. I was greatly impressed by the many weird and wonderful rock formations along the hundreds of miles of forbidding coast line from Iraq down the Persian Gulf, then over the Gulf of Oman to India.

So regular are these formations that they seem artificial. At one spot for 40 or 50 miles the rocks sloping down to the sea were like an inverted tile roof, flat slabs of three-cornered rock overlapping each other with remarkable precision, each slab about 100 yards to the side.

At other places the whole coast for many miles inland was a mass of miniature pinnacles of rock, each little peak about 100 feet high, with almost perpendicular sides (see page 370).

As we flew over them at a great altitude, they suggested a bed of spikes, or a kind of legendary hell, such as an aviator might dream of in a nightmare and imagine that he had to make a forced landing on them. As I looked down, the ground did not seem to belong to this earth. I seemed to be flying over a dead planet (see page 371).

SKIMMING OVER RAINBOW ROCK FORMATIONS

Near Bandarabbas we came across some remarkable colored rock formations. There were mountains of deep purple, and right alongside would be a hill of beautiful jade green, and just beyond mountain heaps of deep yellow. In between these upheavals were old, dried-up water beds of silver sand, contrasting with the vivid earth colors all around. There were hillocks of scarlet hue and others of deep indigo.

Afterward I discovered that these were the wonderful oxide formations that have been sought after and mined through va-

Photograph by Sir Alan J. Cobham

THE AUTHOR'S PLANE ALIGHTS ON A SALTPAN NEAR SIWA

Having covered 200 miles of desert in two hours—a journey which would have required two days by automobile—Sir Alan and his guest were met on the outskirts of the oasis of Siwa by an arab camel convoy which had been notified of the visit by telephone (see text, page 350).

rious stages in history. We are told that the Phœnicians came to the Persian Gulf for oxide, and the Portuguese worked a mine on the Island of Ormuz more than 400 years ago. The weather was dull when we passed by, and the rock colorings contrasted vividly, but to my surprise I discovered later that when the sun shone on the same formations the vividness of the coloring disappeared.

It was winter in India and the weather was perfect. As Sir Sefton Brancker wished to visit one or two places where it would be impossible to land an airplane, he went on by train from Karachi, which was our first port of call in India. Here a big mooring mast is being erected for the future airship service, and this port is also the terminus of the air line that is now in operation between Egypt and India.

Our flight from Karachi to Delhi was via the Thar, or Indian, Desert and Jodhpur. On the first day we successfully crossed the desert, a journey of several hundred miles, and, having located a big river, I began to look ahead for the town of Jodhpur (see page 371).

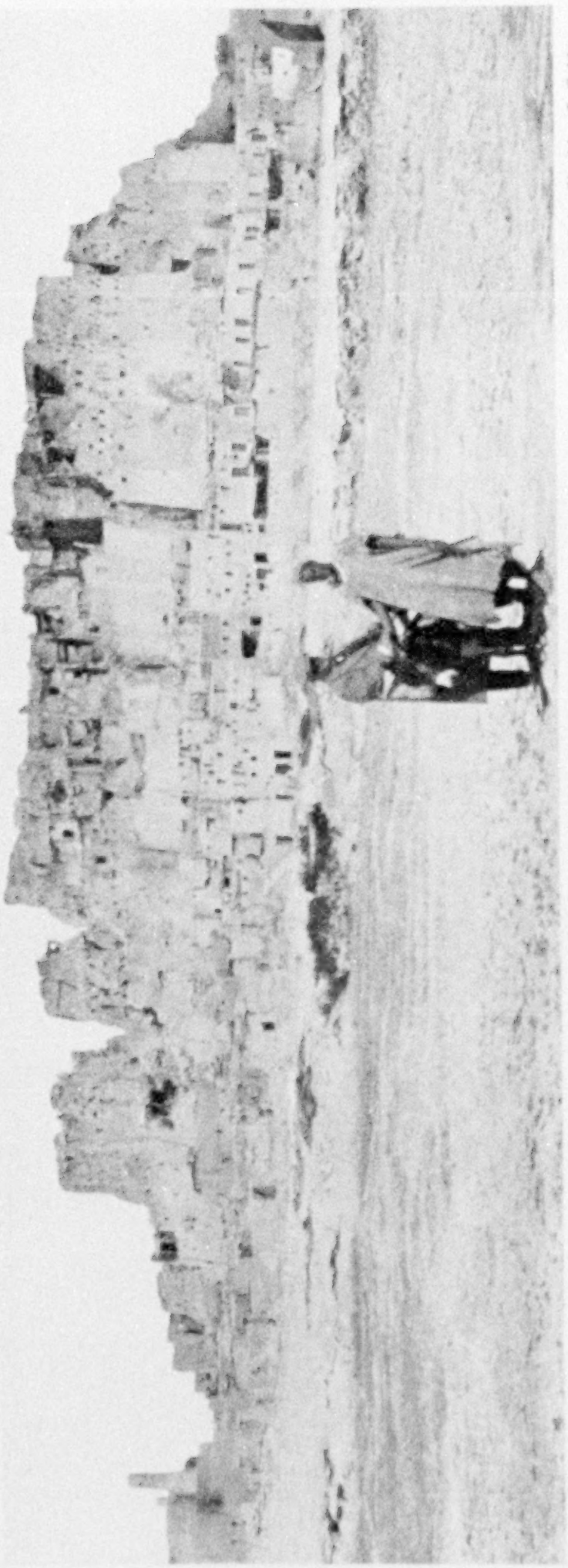
We were to be the guests of the Maharaja, who has a palace crowning a rock that towers hundreds of feet above the level plain on which the capital of the native state is built. I soon located it on the horizon, and then remembered that the Maharaja had a private airdrome. As I neared the town, I could see on the far side an enormous cleared space surrounded by beautiful trees, which I instantly surmised was the airdrome, although I did not approve of the surrounding high trees.

NARROWLY MISSING A POLO MATCH

I already knew the direction of the wind by the various smoke fires that I had seen in the fields, so made straight for the landing ground.

As we were passing low over the tree tops, I looked over the side of the machine and discovered that on the edge of this ground there was a magnificent pavilion thronged with fashionably dressed people. Near by a military band was playing. It was all very bewildering, for I could not imagine why there should be such a wonderful turnout for the mere arrival of an airplane.

By this time I was almost down on the ground and was just preparing to flatten



Photograph by Sir Alan J. Cobham

THE DRIED-MUD TOWN OF SIWA STANDS ON A HIGH ROCK IN THE LIBYAN DESERT

Around about the town, which resembles in some respects an Arizona Hopi village, lies the historic oasis of Jupiter Ammon, planted with palm trees, orchards, and grain.

out and land, when in the distant corner of the field I noticed a couple of mounted polo players cantering around the corner. I suddenly realized that I was about to descend in the middle of a polo match.

Without hesitating, I pushed my throttle wide open, and before my wheels could touch the ground my engine had opened out and the plane climbed away into the air over the far tree tops. I found the real airdrome near by and got down easily.

A GLIMPSE OF THE TAJ MAHAL FROM THE AIR

On our journey across India we turned aside toward Agra, so that we might have a glimpse of that world-famous monument, the Taj Mahal. We circled around many times at an elevation of a few hundred feet, admiring the beauties of this marble tomb erected at the order of a Mogul emperor to the memory of his favorite wife. Arthur Buller Elliot, my engineer, did his best to take photographs, while I maneuvered the machine in order that he might get the views at the best possible angles (see page 372).

Our original plan had been to fly to Karachi only, but once in India we forgot about home contracts and orders, and as gas and oil were available, we just flew on until at last we crossed the whole peninsula and reached Calcutta (see page 372), where it had been arranged that we should land on the Maidan, the open park in the center of the town.

Photograph by Sir Alan J. Cobham

WHEN BRITISH ENGINEERS BUILT THE GREAT ASWAN DAM, IN THE NILE, A VAST LAKE WAS BACKED UP

The impounded river covered ruined temples and relics of antiquity; but waters worth millions of dollars to Egypt were made available for irrigation (see, also, text, page 352).

Photograph by Sir Alan J. Cobham

WHERE ANCIENT TEMPLES RISE ABOVE MUD TOWNS OF THE MODERNS

The great sandstone temple of Edfu, in Upper Egypt, is in almost as good condition to-day as when finished, 57 years before Christ. All through Egypt and the Near East, one is struck by the contrast between the splendid buildings of the ancients and the mean mud houses and ugly architecture of to-day.

The landing arrangements had been made by the local military, for there was no air force in this part of India, and their ideas of airplane landing requirements were a little hazy. A huge crowd was waiting to greet us. The portion of the park cleared for our use was absolutely unsuitable and the other part was thronged with natives and obstructions. I circled two or three times, wondering how I was going to get down.

Suddenly I sighted the deserted race course on the opposite side of the Maidan, and before the crowd had realized what was in my mind we had landed on this.

At Calcutta the Indian Government seemed anxious to have us survey the possibilities of an air route to Rangoon, nearly 1,000 miles farther on, and so we continued our journey along the tropical jungle coast line of Burma.

Somebody suggested that we might go on to Singapore, but I considered that we had come quite far enough; for I was beginning to think now of the homeward journey. London was more than 8,000 miles away, and 17,000 miles would be as much as we could expect from our engine without an overhaul.

At Rangoon great wonders greeted us, for we saw from the air the world-famous Shwe Dagon golden pagoda. There are many golden pagodas in the vicinity, but this is the greatest of them all, and we photographed it from every conceivable angle. I was told that, owing to the fact

Photograph from Sir Alan J. Cobham

THESE FIGURES, 65 FEET HIGH, ARE HEWN IN SOLID ROCK

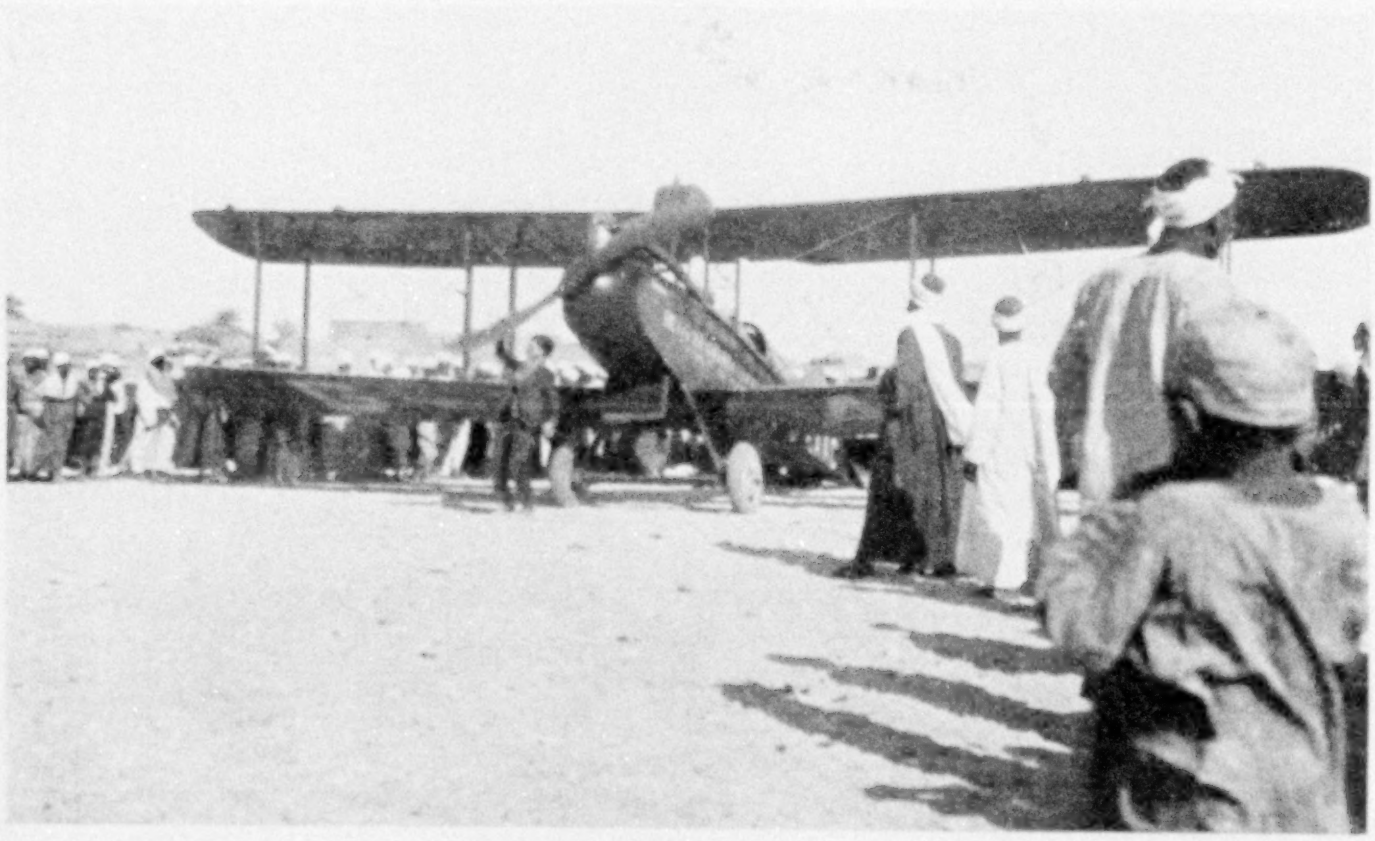
This is the principal temple of Abu Simbel, dating from the days of Rameses II, or about 1250 B. C. The statues flank the entrance to the temple chambers, which are cut in the cliffs on the west bank of the Nile, above Halfa (see, also, text, page 352).

that the roof had been so repeatedly regilded, the gold leaf on certain parts of it was now over an eighth of an inch thick. As we arrived in the late afternoon, the glow of the sunshine on this temple was a sight I shall never forget (see page 375).

MONKEYS OF DATIA DEVELOPED A BREED OF EXPERT MARKSMEN

On our homeward journey through India we were the guests of the Maharaja of Datia, where we stayed a few days. The Prime Minister told us that, when he had arrived in Datia some years before, he had found the place infested with monkeys, which were rapidly destroying the roofs of all the buildings. These cunning creatures were addicted to the delightful pastime of tearing heavy tiles off the roofs of the houses and throwing them down on the passers-by in the streets, sometimes with fatal results. In the course of time they had developed a breed of monkey marksmen who seldom missed.

Now Datia is a Hindu state, and the followers of this religion have a tenet which forbids the taking of life of any sort; so the monkeys were left unmolested. The new Prime Minister decided that something must be done, and so he advised the Maharaja to offer 5 rupees as reward for every monkey captured and brought alive to the cages outside the palace.



A VILLAGE HEADMAN SAVED THE AUTHOR'S PLANE AFTER A FORCED LANDING NEAR ABYDOS, EGYPT

So eager were the curious natives to get near the flying machine that only drastic measures prevented it from being seriously damaged (see text, page 353).

Photographs by Sir Alan J. Cobham

AN AËRIAL VIEW OF UPPER EGYPT, WHERE THE BLESSINGS OF IRRIGATION ARE NOT FELT

The high, rough, empty regions along the upper Nile are much like some of the American Colorado River country. Here flying was precarious.

© Underwood & Underwood

SHIPS THAT PASS IN THE SUEZ

The news of this drastic action spread all over the countryside and was strongly condemned by the Maharaja of a neighboring state. The critic even went so far as to say that he was fond of monkeys, and that they were allowed to roam about his domain unmolested.

In the meantime at Datia hundreds of monkeys were being captured daily, and very soon there was not a simian left roaming free. The Prime Minister was now faced with the problem of disposing of them. He hit upon the bright idea of having them packed in baskets and loaded on board a special train which was dispatched to the neighboring state of the Maharaja who professed a liking for monkeys. When the train arrived in the chief town, several hundred miles from Datia, the animals were unloaded and let loose as a special gift to the potentate.

A LONGITUDINAL SURVEY OF AFRICA BY AIR

It was a huge practical joke, and was talked of all over India. The poor Maharaja who had condemned Datia's action could say nothing, although inwardly he must have been furious.

After more than three months away from home I landed on the Croydon airdrome in the early spring, completing the first of a series of three big flights of survey of Empire Air Routes.

Our next big flight was from London to Cape Town and back. For this trip I selected the identical De Havilland type 50 plane that had taken us to Rangoon and back, but instead of the old-type engine, we installed a 385-horsepower, air-cooled Siddeley Jaguar. In order to negotiate easily the high-altitude airdromes in the Tropics, where the atmosphere is much rarefied, it was necessary to have the extra horsepower.

The first part of the trip through France, Italy, Greece, and over the Mediterranean to Cairo was not new to me, because I had covered this ground before on more than one occasion (see pages 349 to 357), and it was not until I had passed over Egypt and was well into the Sudan that I found myself over new territory.

Beyond Khartum we flew over the great Sennar Dam, recently completed across the Blue Nile, which prevents so much water running to waste in time of flood after the heavy rainfalls in Ethiopia. The

Photograph from Brig. Gen. P. R. C. Groves

THE SINAI DESERT SEEN FROM AN ELEVATION OF 4,500 FEET

The small caravan nearly in the center of the photograph is moving down to the cisterns and wells to the left, at a place about 70 miles east of Kantara. The men and camels are difficult to see, but their shadows are clear. When looking down vertically from an airplane, the shadows of objects are often the most important clue to their nature.

dam has created a gigantic reservoir, which stores water for an enormous irrigation system that makes available for cotton growing more than a million acres of hitherto waste land.

As we journeyed south we were greatly impressed by the changes in the native tribes. At Malakal our machine was entrusted to the Shilluks, who placed it in the center of their village (see page 378). After Malakal we flew for nearly 400 miles to Mongalla, over a swamp region known as the Sudd area, through which somehow the Nile wends its way. The swamp is inhabited by various primitive tribes, who lead a simple existence, knowing nothing about clothes and the habits of civilization.*

At Mongalla, owing to the great heat, we found that we could do very little manual work, and had to depend upon the natives to help us clean the machine (see page 378).

We had traveled nearly 3,000 miles up the River Nile from the Mediterranean coast, yet at Mongalla we were only about 1,000 feet above sea level. In the next two or three hundred miles, however, the ground rose suddenly, and at Jinja, on the shores of Lake Victoria, we found ourselves on the high plateau of central Africa, more than 4,000 feet above sea level.

Owing to the heat, the altitude and other local conditions, the density of the atmosphere was very different from that of northern Europe. At times the air in central Africa on some of the landing grounds was equivalent to the atmosphere at 10,000 feet in England, and it was here that we found the need for our extra horsepower in order to take off and climb away on the rarefied air.

Near Jinja we saw the Ripon Falls, the source of the White Nile, and the only outlet to the great Lake Victoria.

FLYING THROUGH THE MISTS OF VICTORIA FALLS 50 FEET ABOVE THE BRINK

Of our journeys through Tanganyika and Northern Rhodesia there is no space to tell in this article. But we cannot pass by the Victoria Falls without describing how the Zambezi, which is a mile and a quarter wide at this point, flows gently on its way and when seen from an airplane seems suddenly to disappear into a crack in the earth.

This great African river falls for 360 to 400 feet into a narrow chasm. In the center of this cleft is the only outlet, a narrow gorge through which all the mighty waters have to escape.*

On this flight to Cape Town I had with me a professional cinematographer, Emmott, in addition to my engineer of the England-to-India trip (see text, page 360), and while Emmott took the motion pictures, Elliot used to try to take the still pictures. When we had flown beyond the falls the sight was so magnificent that we decided to come down low and take a close-up picture of the brink.

This maneuver was interfered with by the continual banks of spray, which kept rising and completely enveloped our machine in heavy clouds of mist as we skimmed along only 50 feet above the brink (see pages 376 and 377).

While we were flying at this low altitude over this perilous country, our engine faltered and started to splutter. Elliot and I both realized what had happened: the spray was so heavy that water had entered the carburetor.

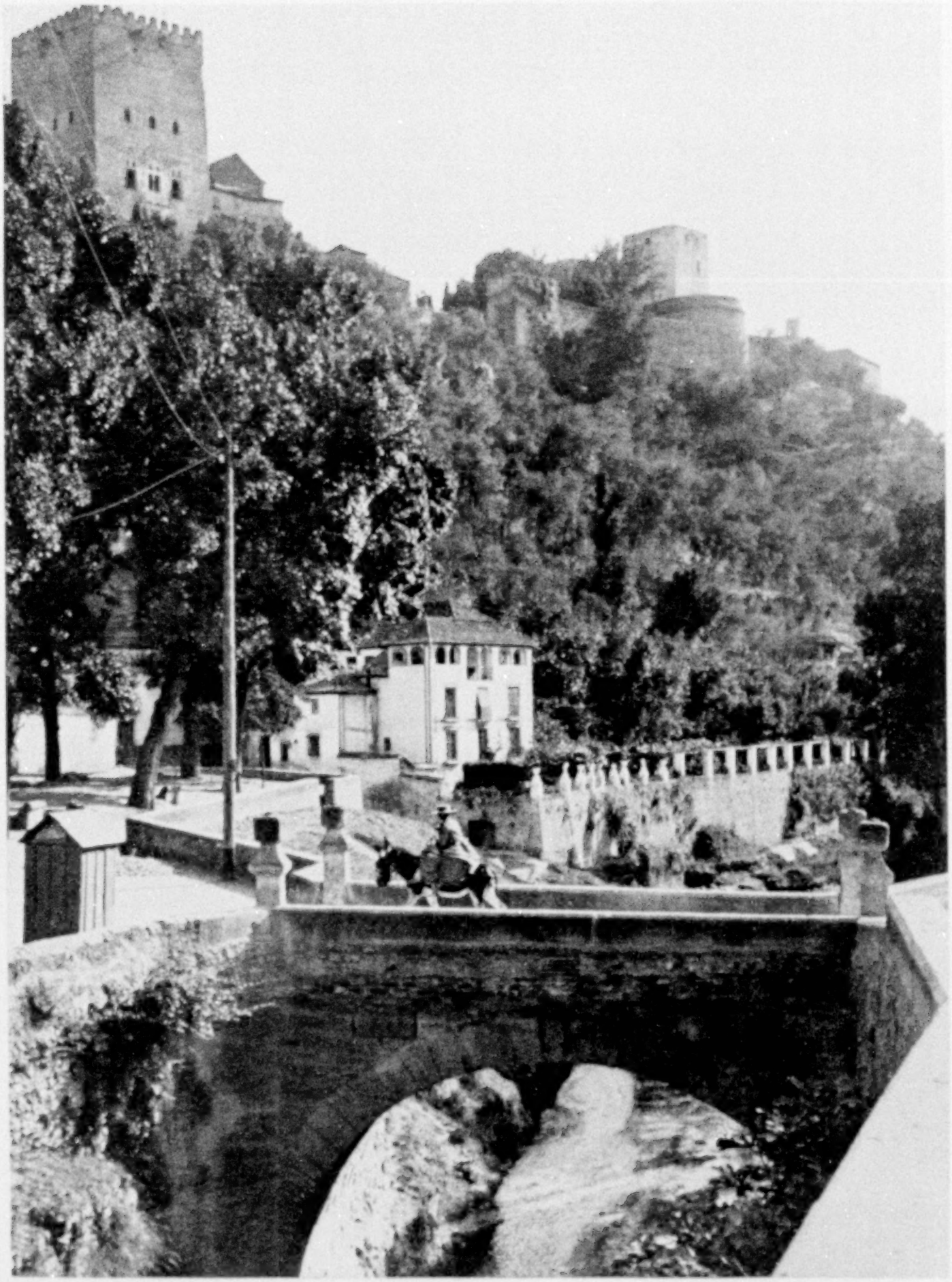
It was an unpleasant moment, for beneath us was the deep chasm and the turmoil of waters, while on the one side we had the River Zambezi flowing toward the brink, and on the other a dense forest jungle; and for miles around no earthly chance of finding a cleared space on which to land.

I gave the engine full throttle, and while it banged and spluttered we climbed away and headed for our airdrome at Livingstone. Fortunately the carburetor cleared itself of the drops of water, and once more our motor began to purr smoothly.

All the way through Africa we surveyed the possibilities for air routes, and finally reached Cape Town with the first airplane to make the cross-continent flight. Then, after a brief overhaul of the motor, we turned about and flew home, making the return trip in 15 days.

* See, also, "Cairo to Cape Town Overland," by Felix Shay, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1925.

* See, also, "The World's Great Waterfalls," by Theodore W. Noyes, in the NATIONAL GEOGRAPHIC MAGAZINE for July, 1926.



© Elmendorf from Galloway

THESE FROWNING TOWERS OF ALHAMBRA HAVE SPECIAL INTEREST FOR AMERICANS

In the spacious throne room in the tower on the left, Queen Isabella gave Columbus her jewel box, bidding him sell the contents and start on the voyage which resulted in the discovery of America. Back in the Middle Ages, invading Moors held Granada, where they achieved this marvel of architecture, Alhambra. In the same year that Columbus came to America, Spain had triumphed over the Moors and claimed the matchless fortress palace as her own.

YOUNG MEN DRESSED FOR A PROCESSION IN SPAIN

As their faces must be covered while they are marching, these youths of Seville are taking advantage of this halt to lift their hoods for a breath of fresh air and for hurried puffs at their cigarettes.

Photograph by Royal Air Force

THE MOSQUE OF THE GOLDEN DOME AT SAMARRA, IRAQ

As one approaches over the Iraq Desert on a clear day, this golden dome can be seen for miles glistening in the sunlight. Long before the World War, it was often predicted in the Near East that if ever armies swept Mesopotamia these rich mosques would inevitably be looted. Yet when war came they were unmolested.

Photograph by Sir Alan J. Cobham

"A BED OF SPIKES, A KIND OF LEGENDARY HELL, SUCH AS AN AVIATOR MIGHT DREAM OF IN A NIGHTMARE"

From Iraq down the Persian side of the Persian Gulf, the airman flies over a mountainous region which bristles with sharp pinnacles, among which no airplane could come to earth and live. These formations in shadow become a veritable kaleidoscope, reflecting deep purples, rich yellows, and brilliant greens (see text, page 358).

It was barely three months later when we again set out on another long flight of survey. This time it was to be Australia and return, but instead of going with an airplane we decided to do the job with a seaplane.

A FLIGHT TO AUSTRALIA WITH THE ENGINE THAT FLEW TO THE CAPE

This meant very little alteration in our outfit, however, for all we did was to take our identical De Havilland type 50, that had already done the Rangoon and Cape flights and fit it out with a pair of Shorts' duralumin all-metal floats. Using the same Siddeley Jaguar engine that had done the Cape flight, we took off from the River Medway at Rochester, 33 miles east of London, on our 28,000-mile cruise to Australia and back.

It was difficult to get good pictures on the Australian flight, because we had purposely chosen to fly through the bad weather period—that is, the hot weather in Iraq and India, combined with the monsoon in India, Burma, and the Malay Peninsula. We wanted to find out whether it would be possible to fly through the torrential rains of the Burma coast, thus making our survey report all the more sound.

TRAGEDY MARS THE AUSTRALIAN FLIGHT

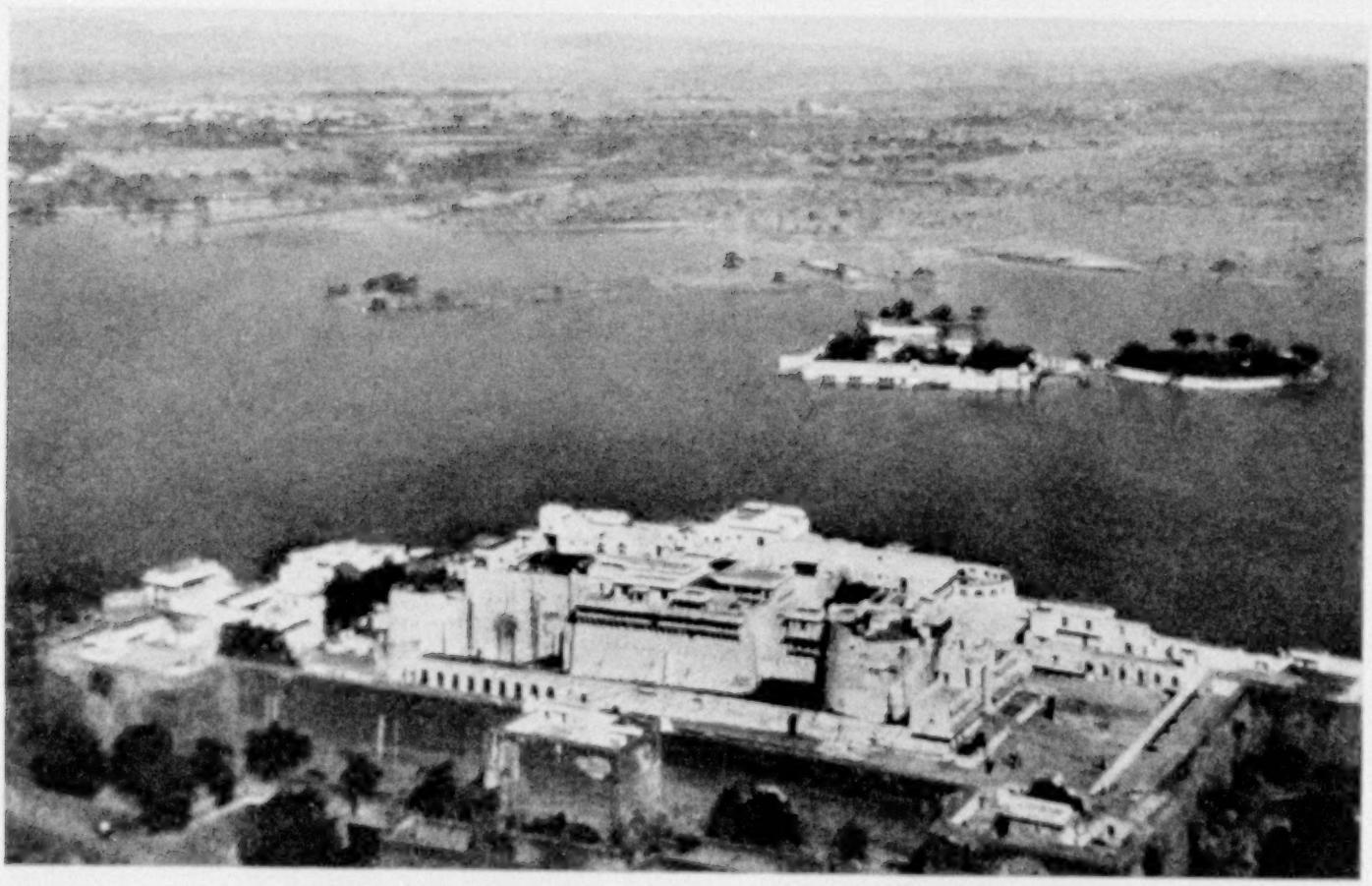
The Australian flight was marred by disaster. Arthur Elliot, my capable and ever loyal engineer, lost his life, dying in the hospital at Basra, in Iraq.

For some unknown reason, possibly the result of overwork in preparing for the flight, I had been suffering from depression, both mental and physical, ever since the start at Rochester. Elliot, on the other hand, had been most cheerful.

We took off from Baghdad in the early

"I SEEMED TO BE FLYING OVER A DEAD PLANET": THE FORBIDDING LAND ALONG THE PERSIAN GULF

"In between these upheavals were old, dried-up water beds of silver sand contrasting with the vivid earth colors all around."



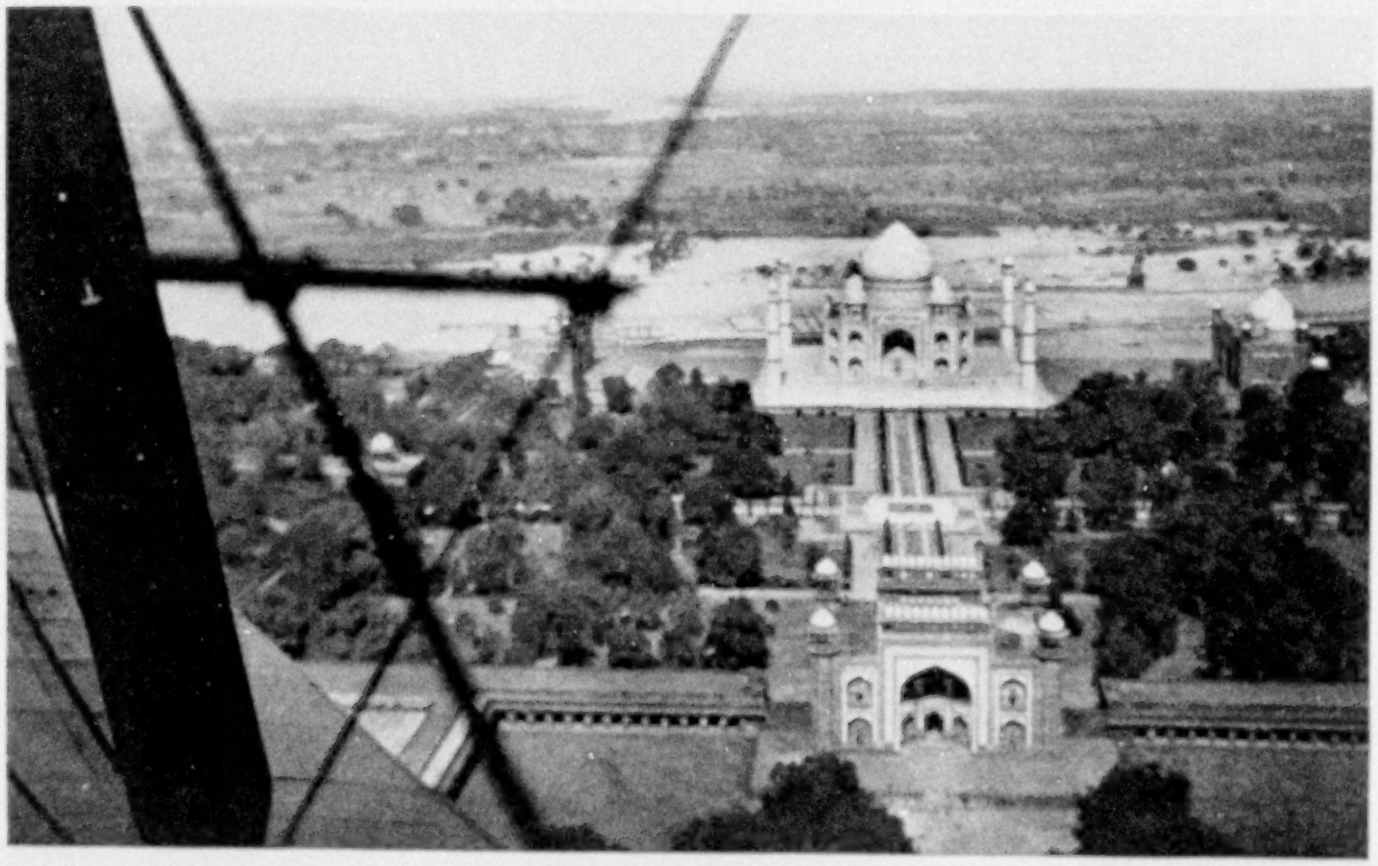
Photographs by Sir Alan J. Cobham

THE PALACE OF KISHANGARH, EAST OF JODHPUR, INDIA

Long ago the princes of India, with their families and retinues, lived safe from enemy assault behind the walls and bastions, the towers and turrets, of such fortified palaces as this. Now, what with air bombing, they are completely vulnerable (see page 359).

GOVERNMENT HOUSE AT CALCUTTA

In 1686 Calcutta was founded as a trading post. Now, with its splendid palaces, parks, and esplanade, its colleges, shops, and factories, and its vast trade by sea and by land with the Ganges and Brahmaputra valleys, it has become one of the great cities of the world.



Photographs by Sir Alan J. Cobham

A MAGNIFICENT TRIBUTE TO A FAVORITE WIFE

This white marble dream, with its all-satisfying beauty and purity of conception, is the famous Taj Mahal Mausoleum at Agra. It has been painted and modeled more often, perhaps, than any other building anywhere. It was built in 1632 by the Emperor Shah Jahan in memory of Mumtaz Mahal (see, also, text, page 360).

Photograph by Sir Alan J. Cobham

HERE DWELLS THE MAHARAJA OF GWALIOR

Into the palaces of her princes India has poured untold lakhs of rupees. Gwalior stands on an affluent of the River Jumna, 76 miles south of Agra. Its citadel has been called the grandest native stronghold in India.

morning, with the intention of following the course of the Euphrates to Basra—near the head of the Persian Gulf. I had not felt fit to start at the early hour of 5 a. m. Elliot and several of the Air Force boys had been looking over the machine while I endeavored to pull myself together. By 8 o'clock, I was able to climb into the ship, but was feeling very weak.

We headed southward from the River Tigris, seeking the Euphrates.

It was fair weather when we started, but after we had gone about 150 miles we ran into a dust storm, which became worse and worse as we proceeded. Finally, in order to find my way, I was forced to come down to within a few feet of the river bank.

We flew for many miles in this fashion, skimming low over the river and taking our direction from the bank, which showed up a little more clearly than anything else through the dust-laden air.

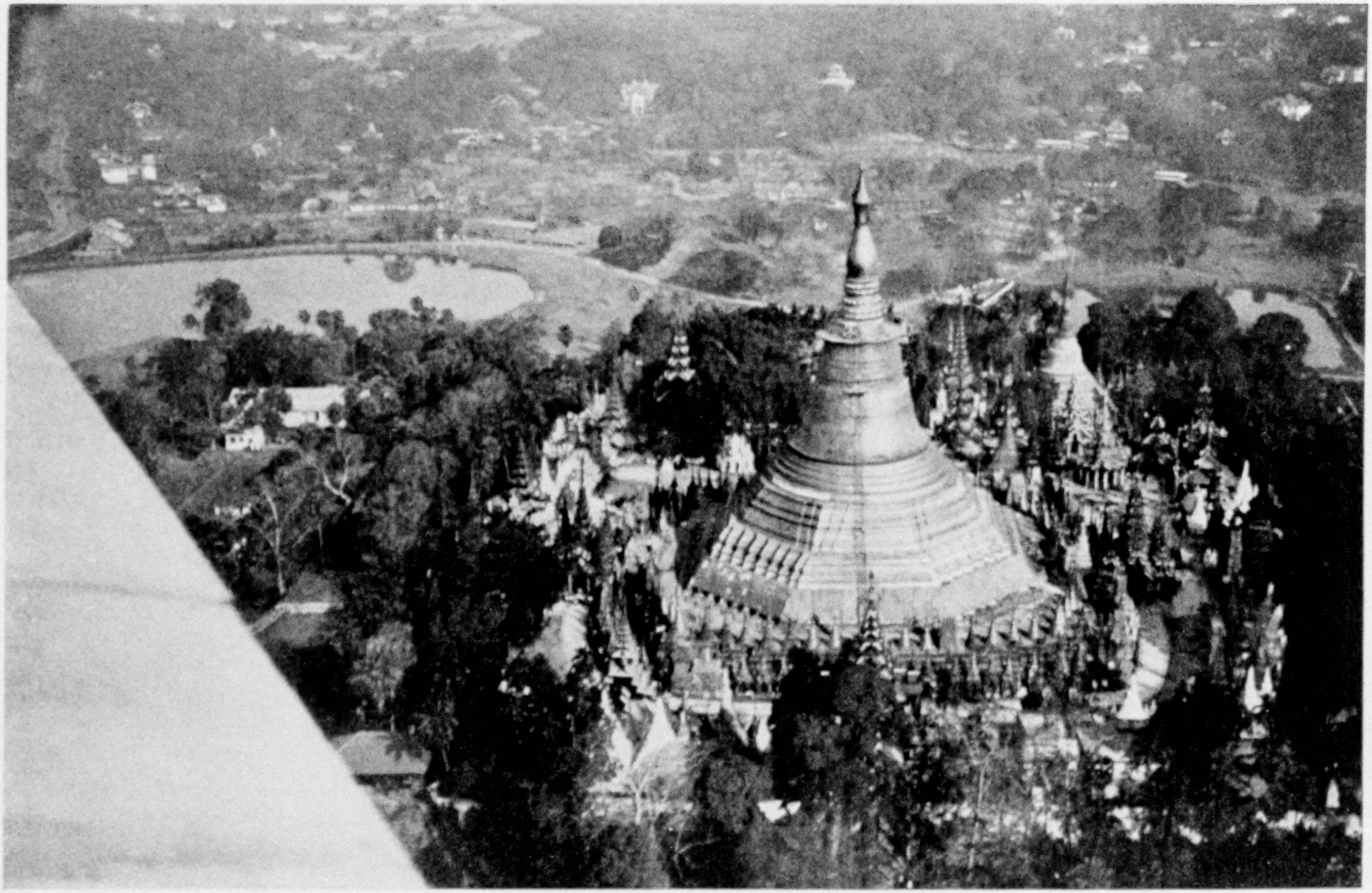
DUST STORM FORCES A RIVER LANDING

At last, the air got so thick that I decided to land on the river and wait for a little while with the hope that the storm might clear. As soon as we alighted, I turned the machine toward the bank and beached it in the soft mud. I shall always

Photograph by Maynard Owen Williams

THE JAMA MASJID AT DELHI, ONE OF INDIA'S NOBLEST MOSQUES

An inscription in Arabic gives the date of the building as 1658, the year in which Aurangzeb deposed his father, the great Shah Jahan, builder of the Taj Mahal (see page 372). The three white marble domes are relieved by thin vertical lines of black marble, and the two minarets, rising to a height of 130 feet, are formed of alternate vertical stripes of sandstone and white marble, crowned by marble pavilions.



Photograph by Sir Alan J. Cobham

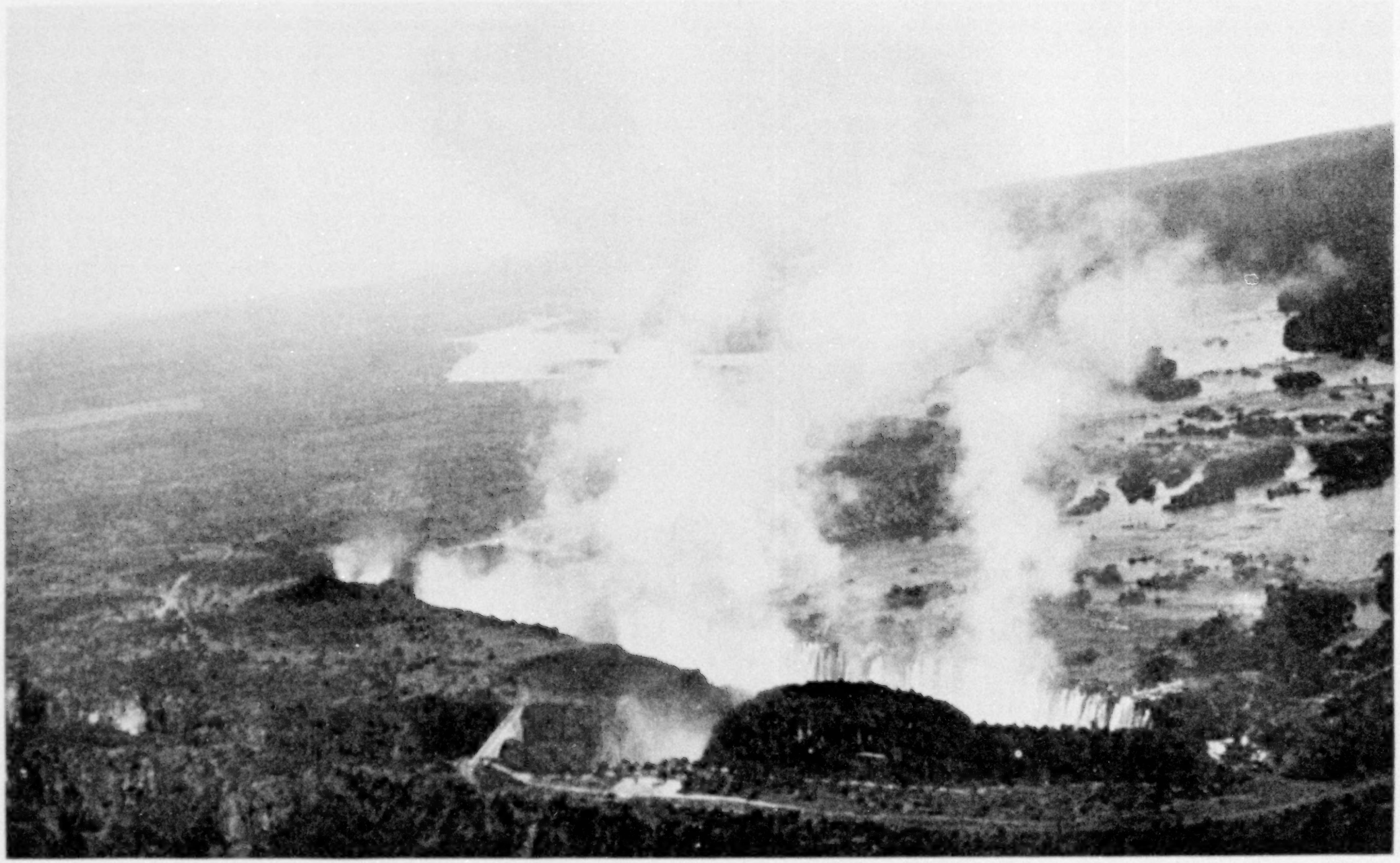
THE PAGODA OF SHWE DAGON, AT RANGOON

Seen only from the ground, the singular symmetry of Indian and Burmese temples is often obscured by surrounding structures, but from the air one may behold these triumphs of oriental architecture in all their bold beauty and dazzling details (see, also, text, page 362).

Photograph by Arthur Elliot

FLYING OVER THE FAMOUS FALLS OF THE ZAMBEZI RIVER, MORE THAN A MILE WIDE

The tumbling waters make a roar like continuous thunder. The 6,225-foot chasm has more than twice the depth of Niagara. These falls were rarely visited by white men before the railroad came, only 23 years ago (see, also, text, page 367).



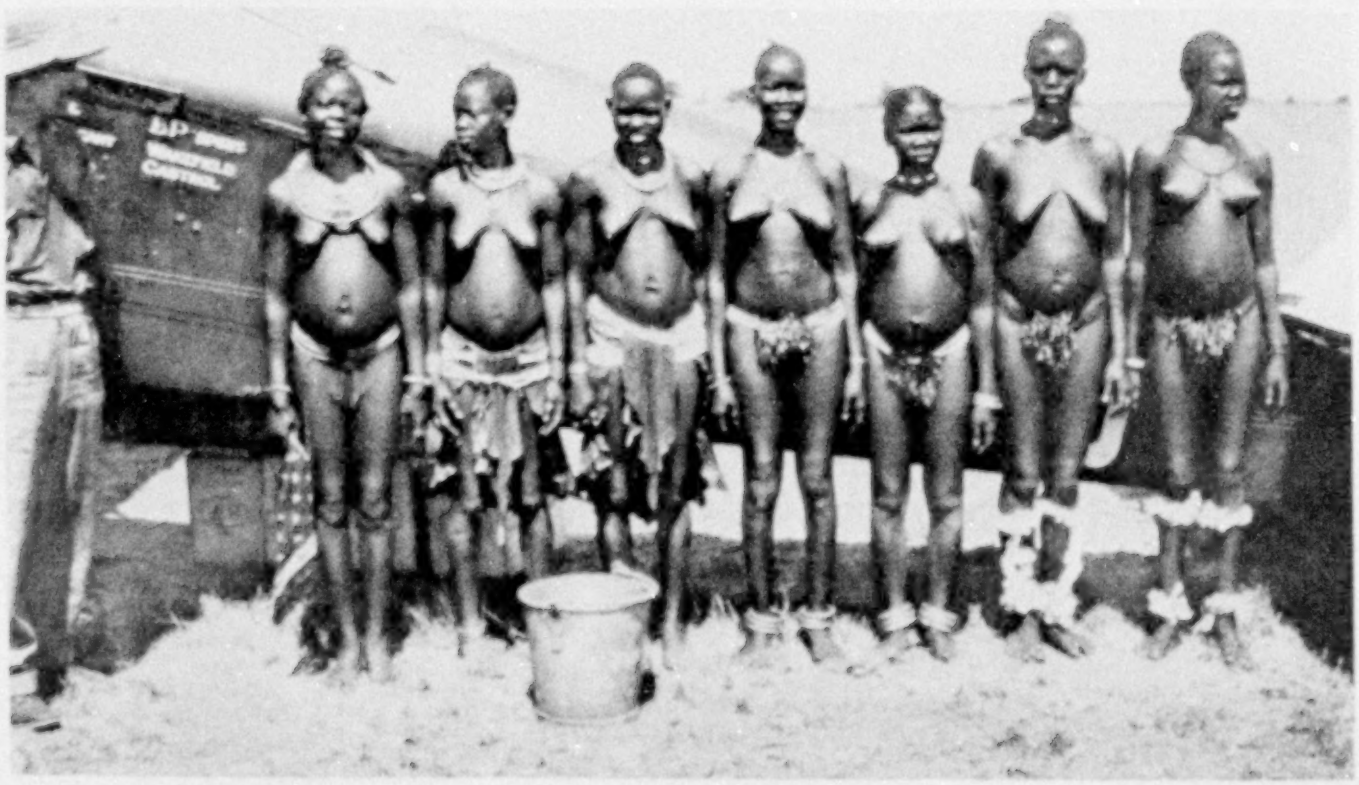
Photograph by Arthur Elliot

"THE SMOKE THAT THUNDERS" IS THE NATIVE NAME FOR VICTORIA FALLS

The first white man ever to see this astounding work of Nature was the Scottish missionary and explorer, Dr. David Livingstone, who, coming down the Zambezi on November 17, 1855, discovered here one of the world's greatest waterfalls and named them after Queen Victoria. The gorge below the falls is spanned by the bridge of the Cape-to-Cairo Railway (see left foreground).

GUARDIANS OF THE PLANE: SHILLUK WARRIORS OF THE SUDAN

Smiling now, friendly with the white man and pleased to be photographed while brandishing their spears, but not so amiable in the days of Stanley, Livingstone, and Mungo Park. To these savages was entrusted the care of the author's plane during his stay in Malakal, on the upper Nile (see text, page 367).



Photographs by Sir Alan J. Cobham

THESE MONGALLA GIRLS WASHED THE PLANE FOR THE VISITING AIRMEN

Owing to the excessive heat encountered by the author in this part of the Anglo-Egyptian Sudan, he and his engineer were unable to perform any manual labor. These cheerful women proved to be willing, though inexperienced, "grease-monkeys," as the aviator terms those who tend his plane.

Photograph from Sir Alan J. Cobham

THE AUTHOR (RIGHT) AND HIS INTREPID ENGINEER, ARTHUR ELLIOT

On the flight to Melbourne, Elliot lost his life, not through airplane mishap, but at the hands of an Arab assassin (see text, pages 381-383).

remember Elliot's enthusiasm for the seaplane at that moment, because, as he remarked, it was so practical and safe; we could take refuge at any moment on the water beneath us.

There was a police hut near by and the native sergeant in charge, after putting a guard in our machine, took us inside where, sheltered from the dust, we rested on native beds that were quickly put up for us.

He then sent a horseman off, with the note that I gave him, to the nearest telegraph station, so that the authorities would know of our whereabouts and progress. After this we slept from 9:30 to noon, then enjoyed a refreshing meal of tea and melon. At about 2 o'clock the storm had cleared somewhat, so we decided to make another attempt.

SKY AND WATER MELT INTO ONE

We took off safely and continued down the Euphrates, but after about 50 miles we ran into another bad dust storm. As we neared the head of the great Hammar Lake I could see that it was going to be most difficult for me to find my way, especially if I went out over the open water. The air above me, owing to the sand storm, was a dirty mud color, and the water beneath was the same. In fact, all around there was sand and one could not see more than 100 yards ahead.

AN EXPLOSION IN THE CABIN

With this poor visibility, it was most difficult to fly, especially as we were traveling at about 100 miles an hour. I felt that if I went out over the open lake I might run the risk of flying into the water, owing to the similarity of color in every direction and the absence of any visible horizon. Under these conditions it was necessary for me to hug the swampy shore line of the lake, so that I might have a view of some sort of land that would give me my equilibrium.

And so we found ourselves zigzagging in and out along this swampy shore, feeling our way around the southern edge of the lake in an endeavor to get through that dust storm and hoping there would be clear air beyond.

Photograph by Royal Australian Air Force

AUSTRALIA'S NEW CAPITAL IS RISING IN THE RAW AND OPEN COUNTRY

Canberra has been boldly laid out, like a real-estate subdivision in some boom city of the American West. Its radiating tree-lined avenues remind one of the original plan of Washington, D. C. The site is in New South Wales, about 70 miles from the coast, some 150 miles from Sydney, and 300 miles from Melbourne.

We had been zigzagging over the swamp for some time and were nearing the more or less definite southern coast when, while flying at a height of about 20 feet from the water, we passed over a low strip of sand that jutted out into the lake. At that moment there was a violent explosion in the cabin!

Instantly I thought of fire and surmised that, owing to the great heat in which we were flying, one of the cartridges for our rocket pistol had exploded. This would be very serious, for it would most certainly have set us on fire.

I yelled through the connecting window from my cockpit to Elliot and asked him if we were on fire. He shouted back:

"No, but a gas pipe has burst and hit me on the arm."

I could see that he looked very pale and, as it was difficult to shout above the noise of the engine, which I could not shut off to glide, as I was flying only at 20 feet from the earth's surface, I handed him a pencil and paper. He handed me back a message written in a shaky hand to say the gas pipe had burst and hit him in the arm and that he was bleeding a pot of blood.

"WHAT'S BEST FOR ELLIOT?"

I had to decide what to do. If I landed to render him first aid I ran great risks: first, of getting stuck in the mud, in which case we should be unable to get off again; second, of being unable to start the engine single-handed, owing to the terrific heat of the district.

I could see that if I landed in this wild and desolate spot, scores of miles from any sort of habitation, it would be a very serious matter if I were unable to start up and get away from it again. I could not look around me. I had to concentrate every second while I was flying, owing to the density of the dust storm.

I decided the best thing I could do would be to race on to Basra, which was about 100 miles farther on, where I knew there would be hospitals, white people, and proper organization. Soon after this we got through the storm and I was able to give the engine full throttle, so that we covered that 100 miles in about 45 minutes.

When I arrived at Basra I searched for a mud bank where I might beach the machine without damaging the floats, but I knew that it was going to be a one-man job.

I spotted a place, came down, and the moment I touched the water I made straight for this bank and ran my floats high and dry on to the shore.

ELLIOT, MORTALLY HURT, THINKS FIRST OF THE ENGINE

I climbed out of the cockpit and lifted the lid of the cabin.

Elliot was in a terrible condition. He sat huddled in the corner, so pale that he was almost green. He could hardly speak. He just murmured to me that he was sure that he had a hole in his side from which he was breathing.

I managed to lift him in my arms out of the cabin, then on to the wings and so down to the floats.

There is one little episode which I shall never forget; it goes to prove how devoted Elliot was to his job.

It so happened that, with our air-cooled engine, the bottom cylinders were upside down. In order to prevent the oil from draining into them when the engine wasn't running it was necessary to turn the oil off immediately the engine stopped. Therefore, one of Elliot's jobs on landing was to turn the oil off when the motor stopped. As I had him in my arms, staggering down on the floats, he turned to me and said, "Don't forget to turn the oil off."

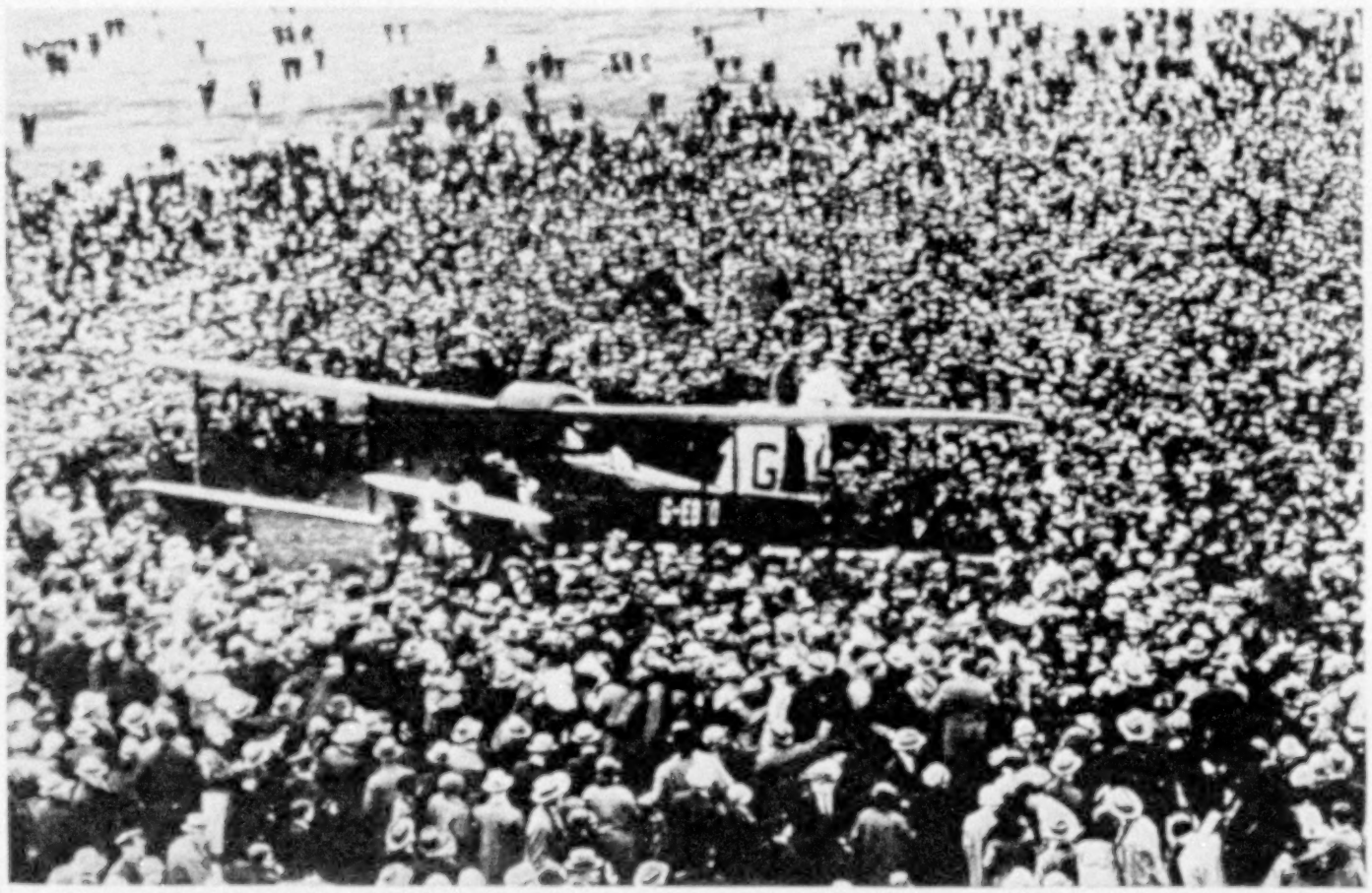
Here was a man, suffering agonies, hardly able to breathe, and yet he could remember to tell me to perform the routine necessary to maintain that aircraft!

I had to lay Elliot down on the mud bank and get him some cotton wool from our first-aid bag. I did what I could to dress his wounds. There was a hole in his left side beneath the arm, as well as in the arm itself.

I wanted to get a stretcher and ran to a house where the natives closed the door in my face. Just at that moment a launch came along and in it were some officials of the Anglo-Persian Oil Co.

Quickly we went to another native house, and this time I put my foot in the door and took the first bed that I could find.

I think the natives were frightened at the sight of blood, as we had difficulty in



Photograph from Sir Alan J. Cobham

AUSTRALIA ACCLAIMS THE TOURISTS OF THE AIR

Sir Alan's long London-to-Melbourne flight ended, amid scenes of amazing enthusiasm, at Essendon, five miles from Melbourne. Such a mass of people crowded the airdrome, rushed the barricades, and clambered over the plane that only with difficulty was it moved into the hangar.

getting them to help us. Very soon we had lifted Elliot on to the improvised stretcher and had him on board the launch, and ten minutes later he was inside the manager's bungalow, with cool air and all hands working.

The doctor arrived and all that could be done was done. It could not have been more than an hour and a half after the accident that Elliot was in the hospital and all help possible was being rendered. Then I turned to my machine, which had been towed up into a backwater near the Air Force depot in Basra.

THE MYSTERY SOLVED—A BULLET

The commanding officer asked me to relate the experience and I told him exactly what had happened, and before I finished my story two young officers left the room. Soon they returned and asked me to follow them down to the machine.

"First," they asked, "why should a gas pipe, with no pressure in it whatsoever, burst?"

I couldn't imagine how it had occurred.

Then they pointed to a hole in the side of the cabin and told me to look inside, and when I climbed on board and inspected the inside wall I pulled out a mail bag and a dispatch case, each of which had been drilled by a missile.

It suddenly dawned upon me that we had been shot at and that it was not a burst gas pipe that had wounded Elliot. A bullet had passed through the side of the cabin, through the mail bag, through the dispatch case, right through the gas pipe, then had entered Elliot's left arm, shattering the bone, passed on into his left side, pierced both lobes of the left lung and finally buried itself in his back.

We had been shot at by an Arab and the noise of the explosion that we had heard had been the firing of the gun at close range.

I received an order from the Air Force directing me to go out to the airdrome, about 20 miles away, so that on the following morning, at dawn, I could lead a

Photograph from Sir Alan J. Cobham

GLIDING DOWN OVER WESTMINSTER BRIDGE

As a wild goose, weary from long hours on the wing, the author's plane ends its Melbourne-to-London flight, a journey of 28,000 miles.

squadron of airplanes to the place where the tragedy had occurred.

About 12 o'clock that night there was a telephone call from the hospital. When I answered it I could not understand, or, at least, could not believe what the operator was telling me, and so handed the receiver over to the commanding officer, who slowly repeated the words: "Elliot passed away at 11:45."

The news was a terrible shock to me, for I had no idea that he would succumb to the wounds.

THE ARAB ASSASSIN IS CAPTURED

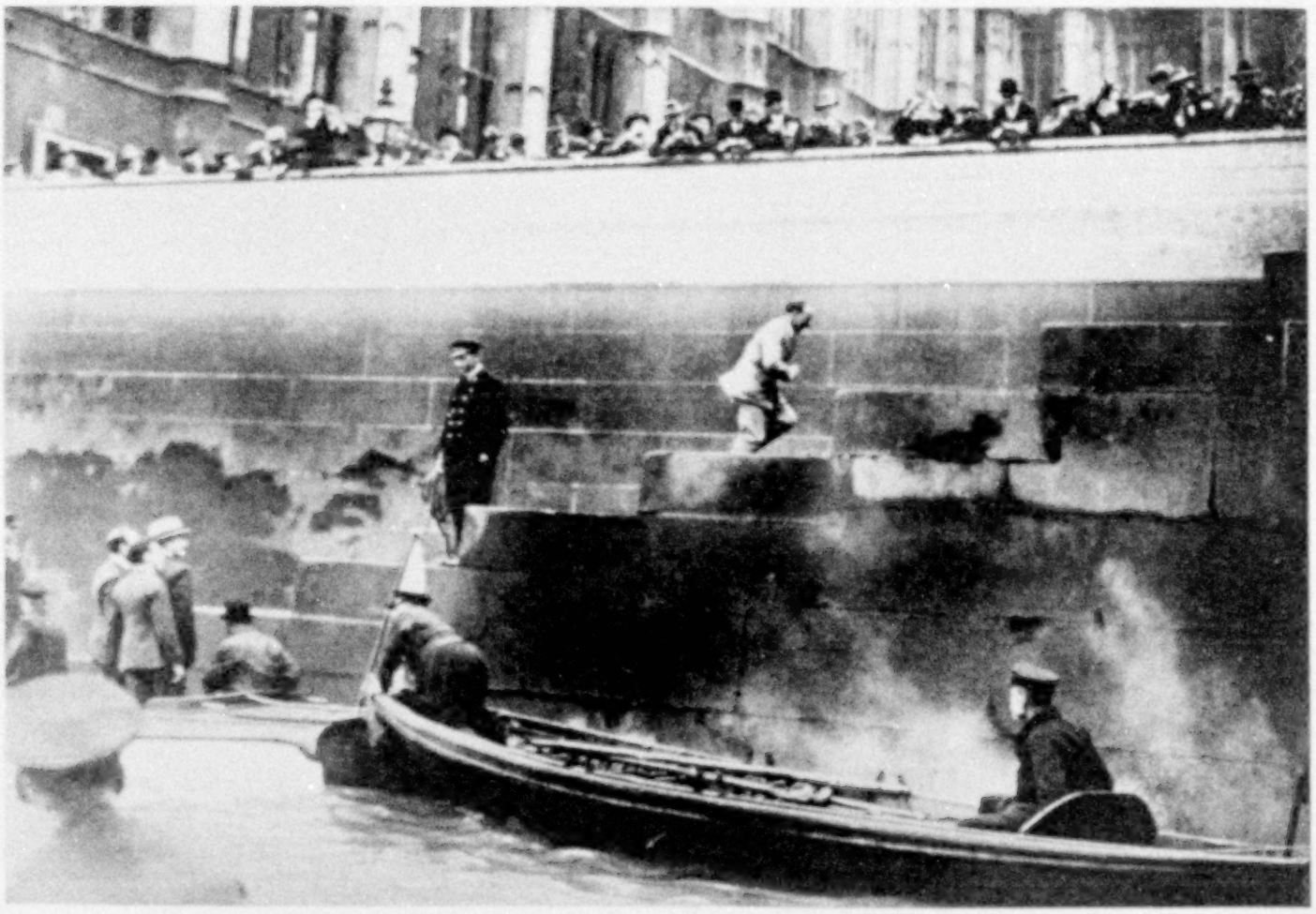
I waited until 4 a. m., and then, as dawn came, we took off, and by retracing my route of the previous day I came to the spot where I felt sure the gun had been fired.

One of the officers, who was in another machine, on a signal from the commanding officer, landed. He ascertained from a local encampment what tribes had been there the previous day. That started the investigation which resulted in the ultimate capture of the culprit, who later confessed, his only excuse being that he wouldn't have committed the crime if he had had any idea that he was going to be found out.

Some of these tribes have been in the habit of raiding the villages in that part of the world for centuries, but recently they have had their activities curtailed by the Royal Air Force. Thus many have no love for airplanes, and this, I suppose, was the animus back of the action.

After this terrible tragedy, which meant the loss of one of the world's finest aircraft-maintenance engineers, I did not want to continue the flight, but cables received from England, especially those from Sir Samuel Hoare, Sir Charles Wakefield, and from my wife, all expressing sympathy, urged me to proceed. I decided that I would complete the job.

The Air Force sent me a substitute mechanic, Sergeant Ward, of the Royal Air Force, who was serving with his squadron near Basra. And so, a fortnight later, we continued the journey.



HOME AGAIN AFTER ANOTHER FLIGHT HALF AROUND THE WORLD

Sir Alan Cobham quits his seaplane on the Thames and climbs the stone steps to the Houses of Parliament.

Owing to the lack of sunshine beyond Iraq, we found it difficult to get any aërial pictures on the Australian flight, and it was not until we arrived in Java that we met with regular sunshine.

I shall always have a vivid memory of our arrival in Melbourne, where more than 150,000 people had gathered to meet us. It was with difficulty that we could find space enough to get down on the air-drome, for we had changed over from a seaplane to wheels on arrival at Darwin, in northern Australia.

If it had not been for the police and the Australian Air Force I shudder to think of what might have been our fate had the enthusiastic crowd got hold of us.

TORRENTIAL RAINS IMPEDE RETURN TO LONDON

The homeward journey, when our craft was once more converted back to a seaplane, was beset with difficulties, especially when we were caught in the monsoon storms in the region of Victoria Point. Here the rain fell five inches a day, and at times it was impossible to see more than 20 yards ahead. Whereas the rainfall in England averages about 30 inches over the twelve months, the annual rainfall along the Burma coast, where it all comes within a period of about five months, is anything up to 300 inches!

At last we got back to London, and ended our 28,000-mile flight of survey by landing on the Thames opposite the Houses of Parliament.*

I look forward to the day when it will be possible for all mankind to enjoy the delights of flying such as have been my privilege during the past seven years.

* See, also, "From London to Australia by Aëroplane," by Sir Ross Smith, in the NATIONAL GEOGRAPHIC MAGAZINE for March, 1921.

THE GREAT FALLS OF THE POTOMAC

By Gilbert Grosvenor

THE rock-hewn gorge and magnificent falls of the Potomac River are the most striking scenic features in the vicinity of the National Capital. The broad, calm stream that flows by Potomac Park, separating Washington and Virginia, narrows suddenly above the city. Its shores change from bottom lands and gently rolling hills to take on the sterner aspect of palisades, cut at frequent intervals by deep gullies, through some of which small streams enter the river in tumultuous cascades.

On the Virginia side, where the cliffs rise almost sheer from the water's edge, these ravines are so steep and so numerous that a journey along the bluffs entails more travel vertically than in a horizontal direction.

Just above the ruins of the old Aqueduct Bridge, which formerly carried a canal across the river, the trio of jagged rocks known as The Three Sisters recall a romantic legend of the Red Men who once roamed these rugged shores.

According to the tradition, these rocks mark the place where the three daughters of an Analostan chief were caught in a whirlpool and dragged to their watery grave. They were paddling across the river, so the story goes, to a secret tryst with their Powhatan lovers on the Virginia shore; but the river demons intervened and, after accomplishing the destruction of the sisters, caused the three gloomy rocks to rise from the spot where their bodies sank beneath the waves.

The Virginia and Maryland shores converge rapidly as one journeys up the river, until a few miles above Washington they are separated by less than 100 feet of water, now swift and turbulent.

Above Little Falls, which is a series of rapids, the river widens again. Numerous islands spangle the Maryland shore, while Virginia's cliffs become wilder and more rugged. The waters pursue a more leisurely course here, but it is only a temporary calm before the storm, and 15 miles above the Capital they gather for a majestic plunge over a wall of granite which all the Potomac's ages of work has been unable to wear down.

These falls offer a scene of impressive grandeur. Heaps of rocks are scattered about — enormous granite bowlders and jagged reefs of gneiss—as if some Titan of long ago had vented his wrath by upheaving the crust of the earth itself. The wildness of the place, as the waters churn and boil in their never-ending warfare with the rocks, is comparable only to some of the larger mountain canyons of the West, and is hard to conceive as being within a few miles of the Capital City.

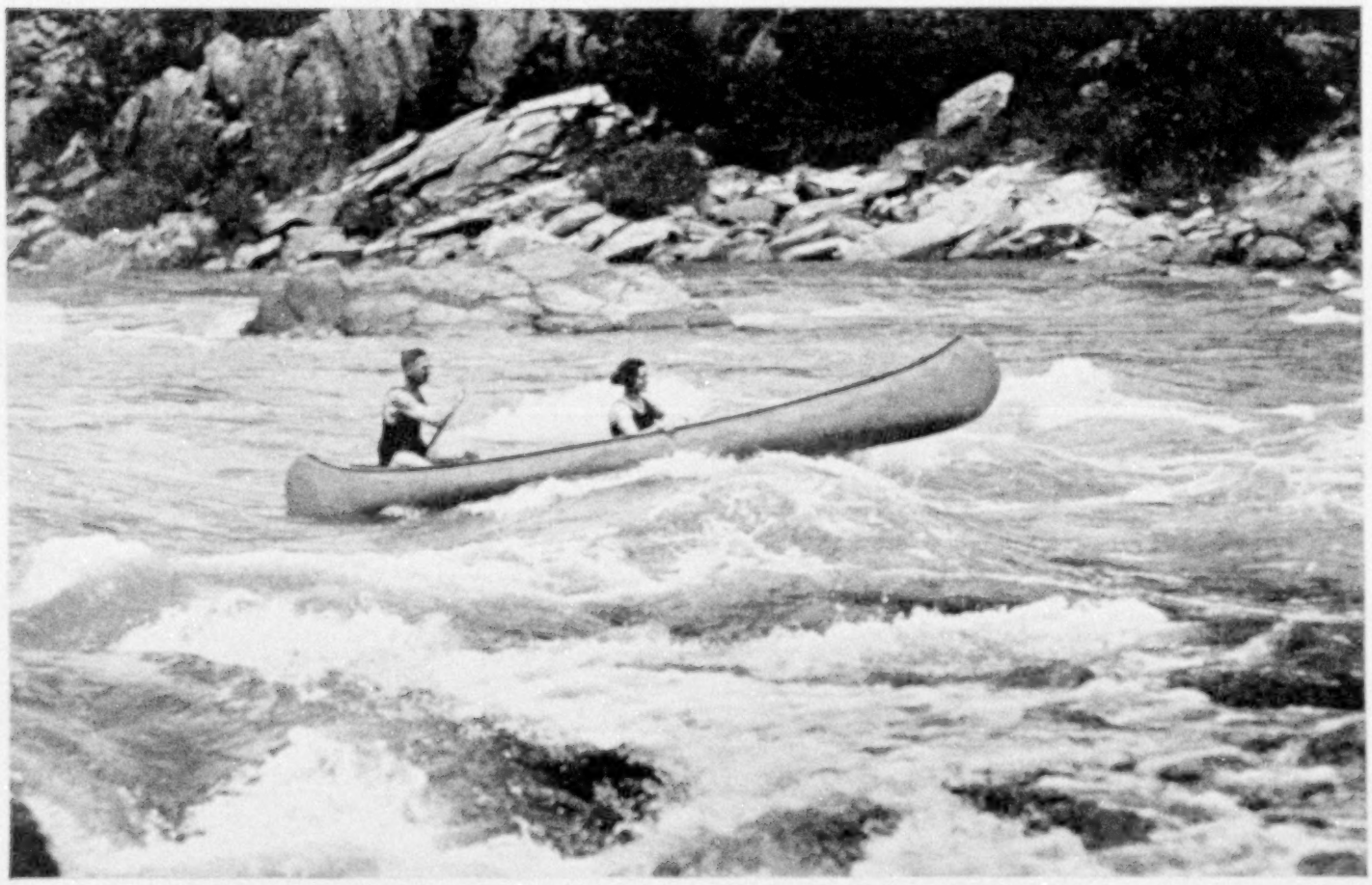
Normally the river here tumbles through a rather narrow channel in its race for the Chesapeake, but when spring melts the mountain snows and deluged valleys pour their overflowing streams into its upper reaches, the falls become a swirling flood that rages from shore to shore with a roar that may be heard for miles.

The old Chesapeake and Ohio Canal, which paralleled the Potomac from Georgetown up to and on beyond the falls, was begun about the same time as the Baltimore and Ohio Railway, and there was once a keen rivalry between them for the freight traffic between Washington and Cumberland. But the "iron horse" outdistanced the faithful, plodding mules of the towpath, and the canal is no longer in operation.

However, transportation's loss has been the gain of thousands who know and love the hike along the towpath, with its great trees and thickets fringing the still waters of the canal, while here and there a moss-encrusted rock, bolder than the rest, juts out like some miniature Lorelei.

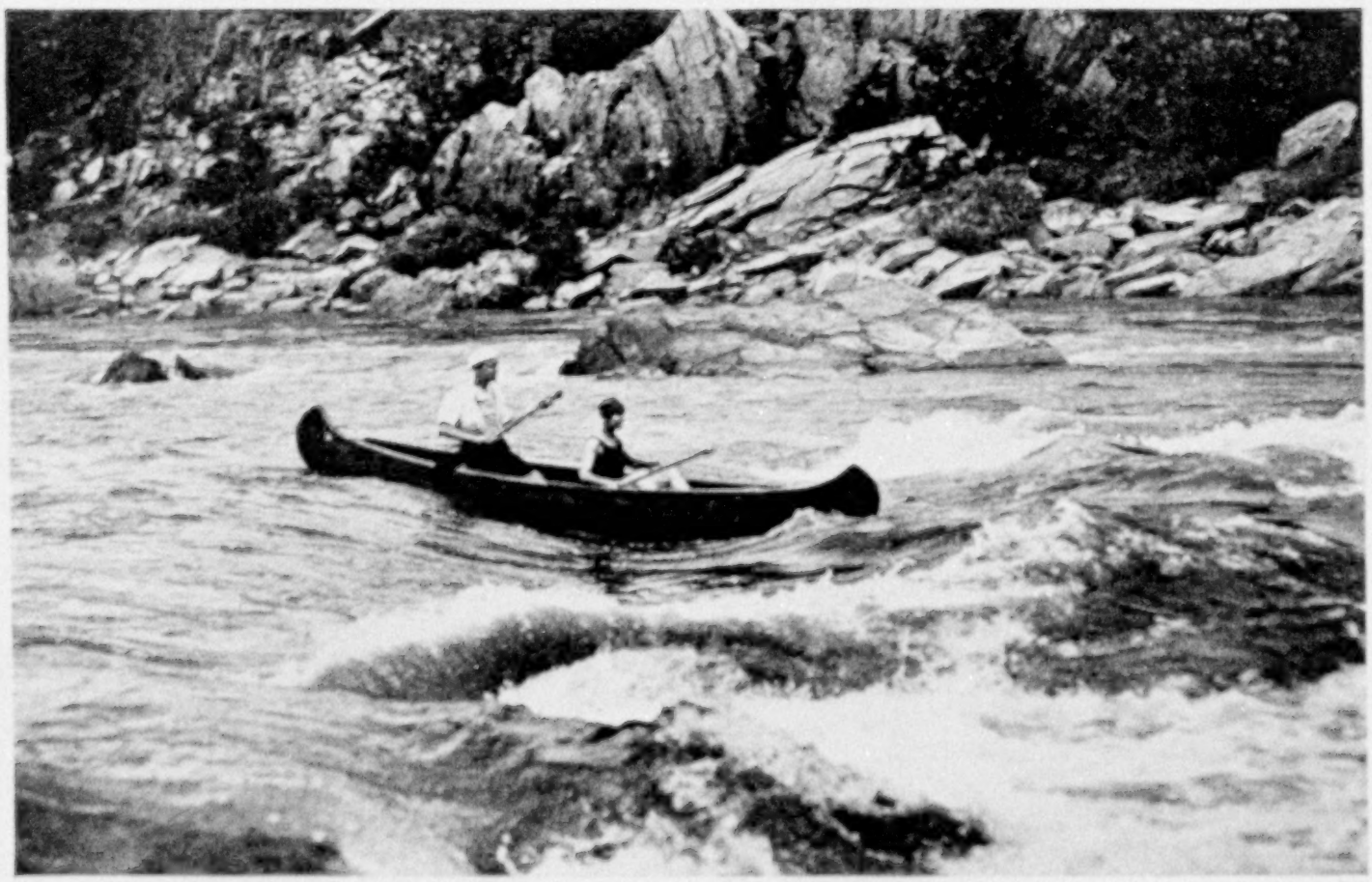
Birds frequent the vicinity in countless thousands. Wrens, sparrows, warblers, thrushes, and myriad other varieties haunt the thickets. Kingfishers seek their prey along the water's edge. Mocking birds are permanent residents of the woods, and the cheery whistle of the lordly cardinal may be heard at almost any time of year. Indeed, at certain seasons this magnificently caparisoned songster is encountered in flocks.

Where Cabin John Creek comes down to the river, man has carried a road across the precipitous valley on one of the world's largest single spans of masonry.



BREASTING "WHITE WATERS"

Summer holidays find many of the bolder spirits among the canoeists shooting the rapids in the main gorge of the Potomac, a short distance below the falls. Bathing suits are the usual costume, for spills are not infrequent.



Photographs by Clifton Adams

THE POTOMAC GORGE PROVIDES THRILLS APLENTY FOR THE PADDLER

Great submerged rocks here produce strange, swift currents and high swells or "thank-you-ma'ams," which sometimes cause canoes to jump completely out of the water in going over them.

THE STRAIGHT AND NARROW PATH TO THE FALLS

This swaying bridge leads over an arm of the river to an island on the Maryland side, from which a good view of the cataract (pages 388-389) may be had. The veteran of river and canal who collects the tolls also makes fish nets.

Photographs by Clifton Adams

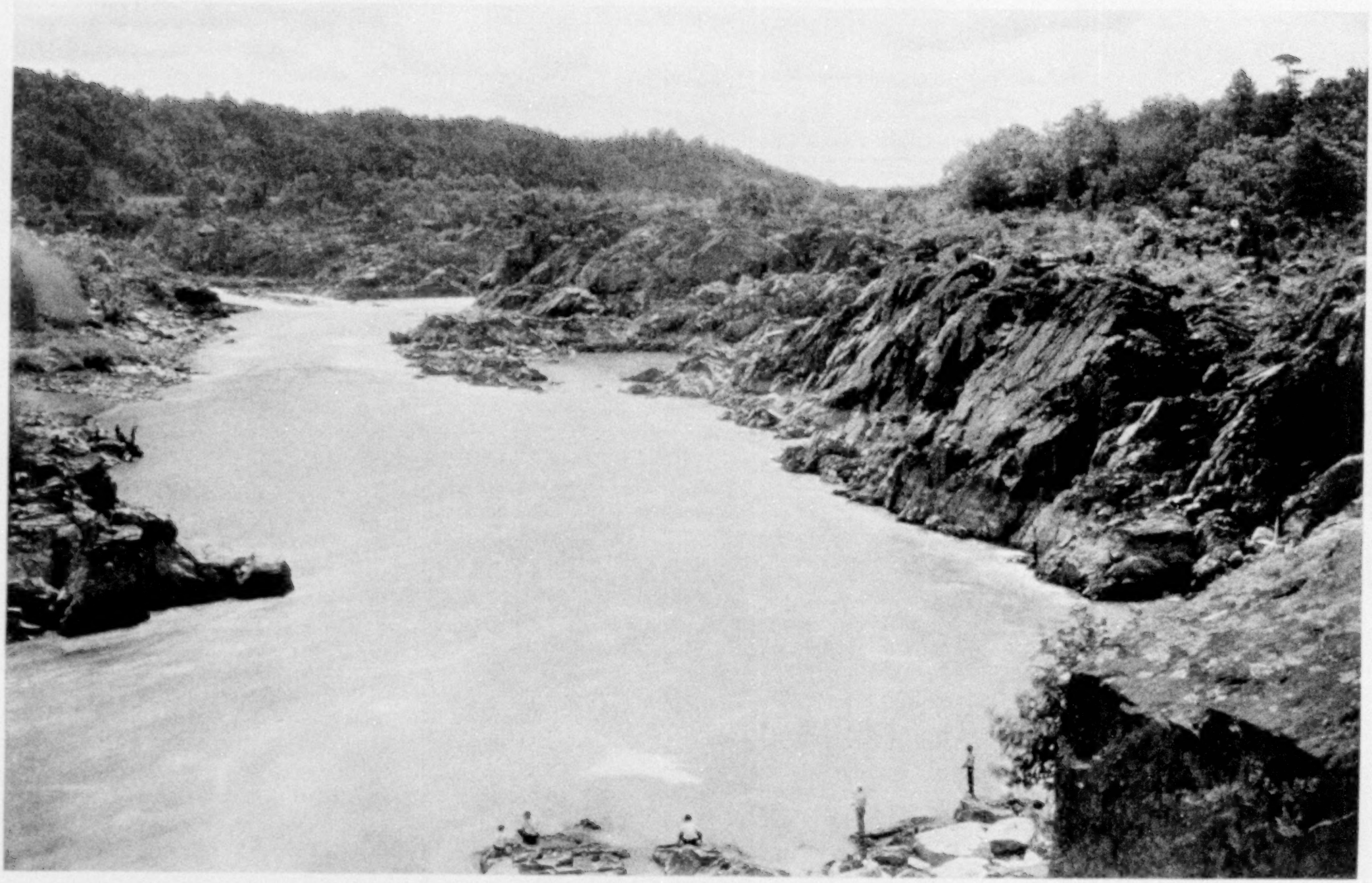
AT AN ANCIENT SPRING

The old Dickey House near Great Falls has survived the better part of two centuries. Its floors and ceilings are of hand-hewn planks, and its scarcity of windows reflects the period of open fireplace heating. Near by is a spring of clear, cold water.

Photograph by Clifton Adams

THE GREAT FALLS OF THE POTOMAC AT LOW WATER

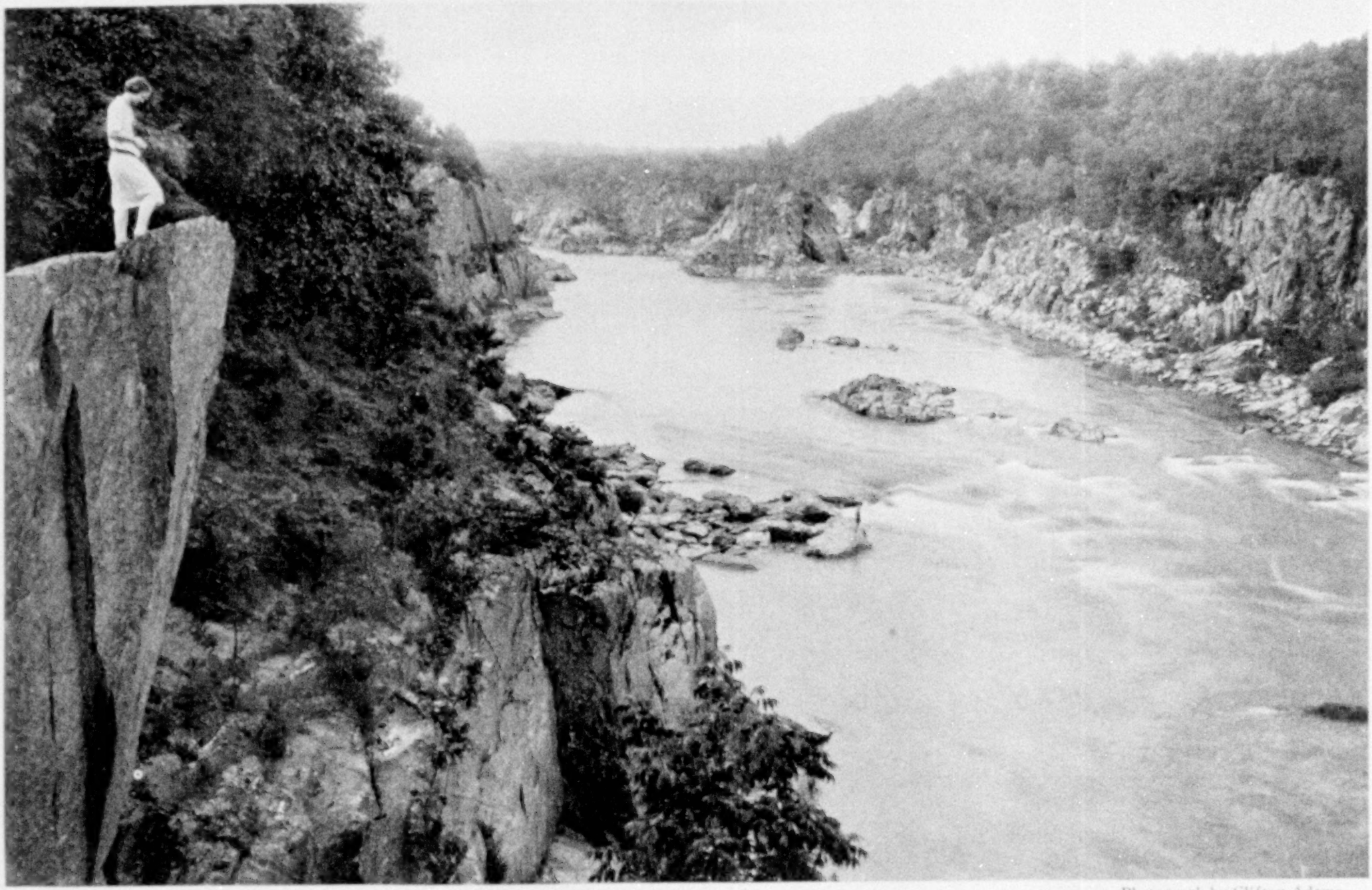
These falls, only 30 minutes from the White House by automobile, form one of the greatest cataracts of our Atlantic watershed. The preservation of these falls and of the Potomac gorge below is one of the basic features of the project which has been prepared by the National Capital Park and Planning Commission, in compliance with the instructions of the Congress, "to develop a comprehensive, consistent, and coordinated plan for the National Capital and its environs in the States of Maryland and Virginia, . . . to preserve forests and scenery in and about Washington, and to provide for the comprehensive, systematic, and cortinuous development of park, parkway, and playground systems of the National Capital and its environs."



Photograph by Clifton Adams

COMPARATIVE CALM SUCCEEDS THE FURY OF THE FALLS

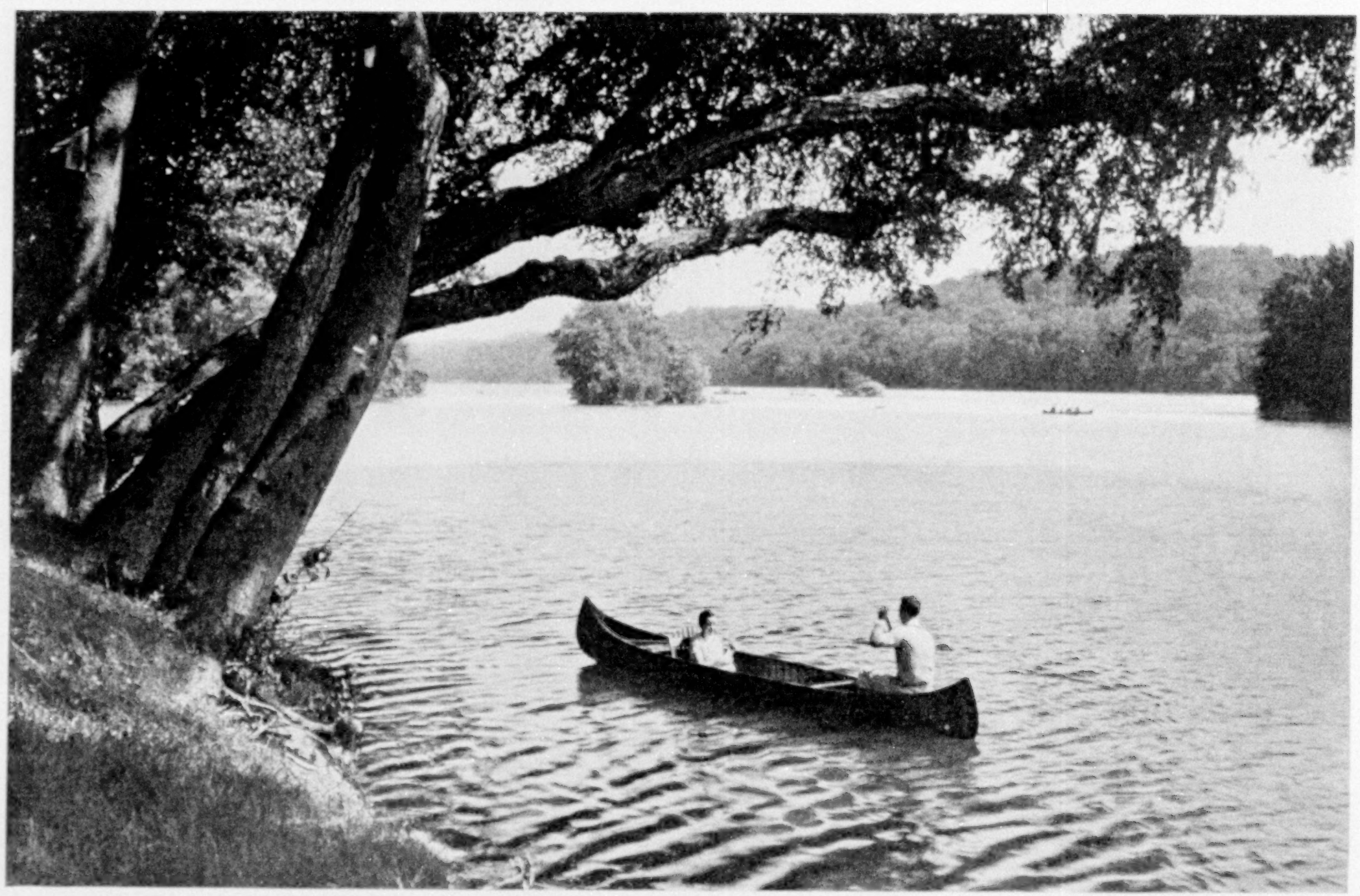
The scenery along the Potomac River between Great Falls and Georgetown is extremely diversified, varying from the frenzy of the cataract itself, through the lesser tumult of the Little Falls, to broad and almost unruffled stretches a few miles below. There are places along the river within a few miles of Washington that are almost as wild and rugged of aspect as the canyons of the West.



Photograph by Clifton Adams

THE POTOMAC CUTS ITS GORGE THROUGH WALLS OF ROCK

Through a solid mass of gneiss and granite rock the river flows between palisades that rise in places nearly a hundred feet above its swift-flowing waters.



Photograph by Clifton Adams

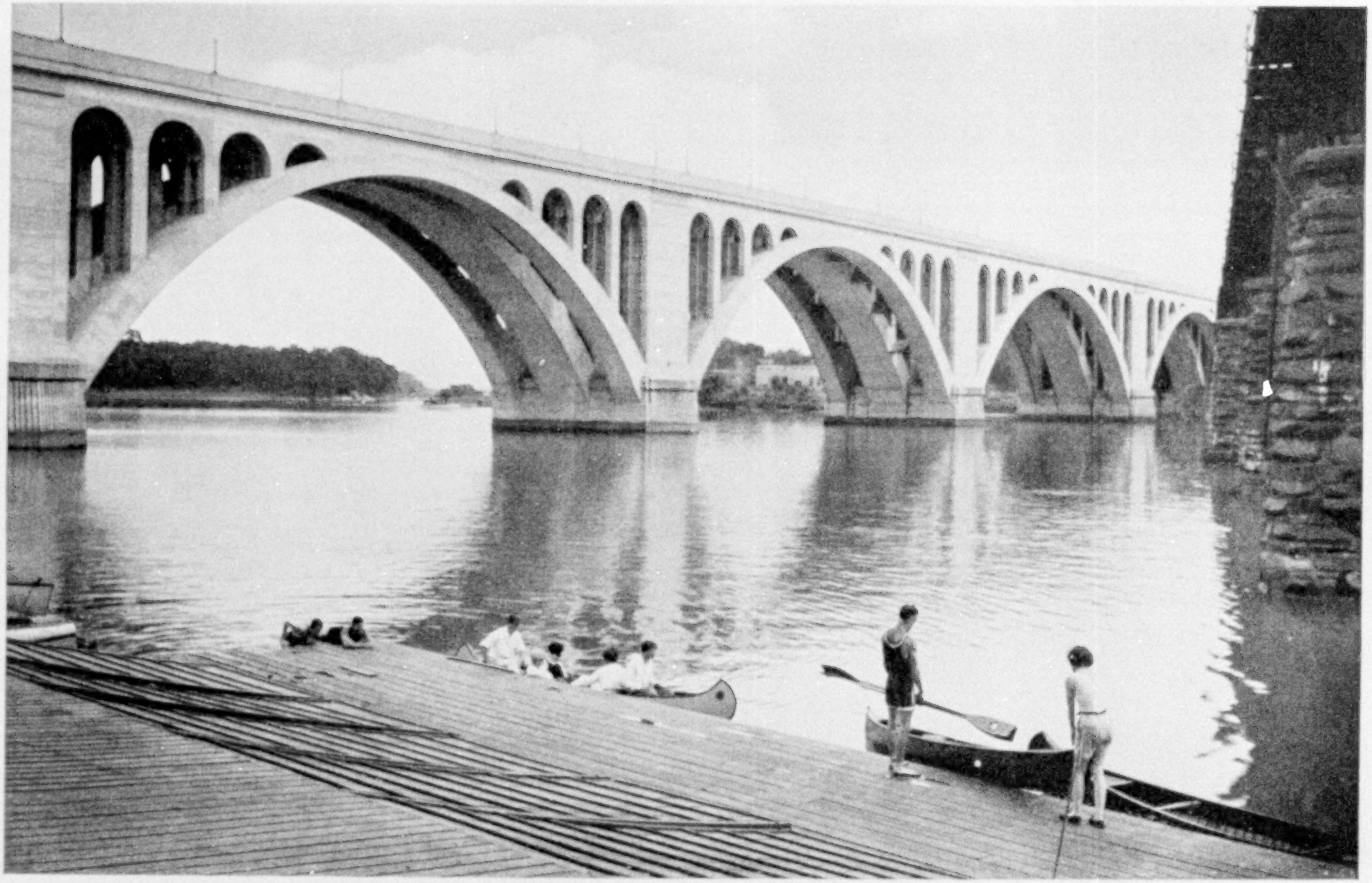
CITY DWELLERS FIND REST AND RECREATION ON THE RIVER'S BROAD, CALM STRETCHES

Thousands of Washingtonians find relief from the summer heat on the cool waters of the river. There are numerous islands above the city which provide, along with both the Maryland and the Virginia shores, excellent camping facilities.

Photograph by Richard H. Stewart

CANOEISTS SPEED THEIR FRAGILE CRAFT IN THE SHADOW OF GEORGETOWN'S STATELY SPIRES

On the heights above the Potomac stands Georgetown University, founded here even before Congress selected the banks of the Potomac as the site of the Nation's Capital. Along the river shore in the vicinity are boat and canoe clubs which sponsor annual regattas and encourage water sports of all kinds.



Photograph by Clifton Adams

GREAT ARCHES SPAN THE POTOMAC AS A MEMORIAL TO FRANCIS SCOTT KEY

At the northern approach to this imposing structure once stood the house of the author of the Star-Spangled Banner. The bridge is 1,456 feet long and has seven spans of from 83 to 208 feet. Through the nearest span may be seen Analostan Island, and the middle arch reveals a bit of the Virginia shore. In the foreground is the Potomac Boat Club, off which the water is nearly 40 feet deep.

BOATS ONCE PASSED WHERE FLOWERS NOW BLOOM

Long before the Revolution, farsighted men in Virginia and Maryland saw the advantages that would accrue if the Potomac were made navigable above Georgetown. George Washington was president of a company organized in 1785 which built a canal around Great Falls on the Virginia side. This is the remains of one of its locks.

Photographs by Clifton Adams

A COMMERCIAL HIGHWAY BECOMES A PLEASURE PATH

Fifty years ago a considerable volume of traffic passed along the Chesapeake & Ohio Canal between Cumberland and Georgetown. Now only canoes navigate short stretches of its drowsy course.

KNIGHTS OF THE PADDED POLE TILT FROM CANOES

Using long, light shafts padded on the end, in lieu of lances, and canoes as steeds, modern mermen emulate the knights of old in tilting tournaments. Their armor, however, is a bathing suit, for one or both of them will surely receive an involuntary bath in the course of the encounter.

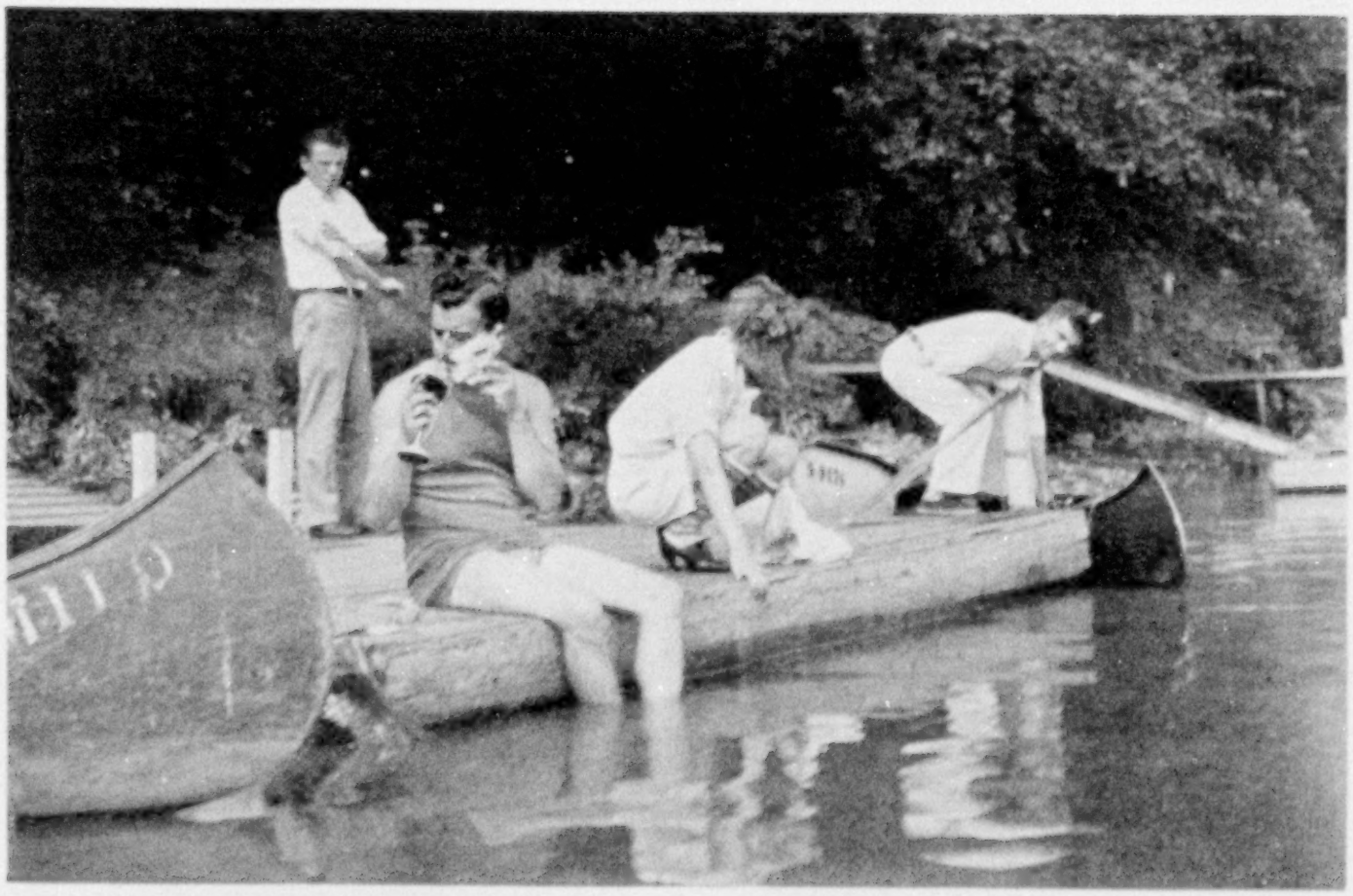
Photographs by Richard H. Stewart

DRIVING HOME THE FINISHING THRUST

There is considerable skill and technique in canoe tilting, and not the least part of a team's success depends upon the ability of the paddler to keep his boat straight and steady. The man handling the pole stands on a small platform in the bow.

THE SABBATH IS NOT FORGOTTEN AMONG THE RIVER CAMPERS

Many persons who have to work in Washington all summer move their whole families to tents and shacks on the banks of the river above the city, where they live through the hot months. On Sunday mornings they attend church under the trees.



Photographs by Richard H. Stewart

SPRUCING UP FOR OFFICE

Many a white-collar worker snatches his morning shave at the river's edge before paddling down to Georgetown to get the car for his desk. Few great cities are so situated that their people may enjoy the pleasures and benefits of camp life during the summer and still continue to work regularly.

Photograph by Clifton Adams

A POSSUM DINNER IS IN EARLY PROSPECT

Along the wooded shores of the river above Washington many small animals are still quite plentiful. Mink, muskrat, weasel, skunk, raccoon, and opossum are all trapped and hunted there. When cooked with sweet potatoes, Br'er Possum makes a succulent morsel.

Photograph by Clifton Adams

LEAF-FILTERED SUNSHINE BATHES AN ISLAND RETREAT

Plummer Island is unique in many ways. It is a bit of virgin land where hundreds of species of new flora and fauna have been discovered. No less than 290 articles have been published describing its biological treasures (see page 385). This area of 11 acres is the outdoor laboratory of the Washington Biologists' Field Club.

Photograph by Richard H. Stewart

WOOD NYMPHS VISIT A POTOMAC SPRING

On the Virginia side of the Potomac River above Georgetown there are a number of private camps. A granite company controls the shore of the Potomac at this point and until recently allowed campers a sort of squatters' sovereignty. This is one of the springs in the campers' haven. Everyone has free access to this water jar of Nature.

In the springtime, however, this valley itself is of far greater interest than its bridge. Ferns and wild flowers adorn it in profusion, and the delicate pink blossoms of the laurel and notched white flowers of the dogwood dapple the greening hillsides harmoniously.

One of the many interesting features of the Potomac gorge is its peculiar situation biologically. In the cool shadows of its steep cliffs the fauna and flora of the upland regions impinge upon those of the coastal plain to provide one of the most engaging and productive fields for biological study in the East.

Plummer Island, in the river above Cabin John, for more than 25 years has been in the possession of the Washington Biologists' Field Club and has served as a station for the observation of wild life (see page 398). An amazing number of new species of plant and insect life has been discovered on this island and every precaution is taken to protect it from depredation and to preserve its value as a natural biological laboratory.

Despite the fact that the river is mostly very swift in this part of its course, there are areas of calm water which are the summer haunts of numberless canoeists and swimmers. The bolder spirits among the devotees of the paddle venture beyond, to shoot the rapids and receive both thrills and spills for their temerity.

The National Capital Park and Planning Commission has a definite program to save this region of truly magnificent scenery as one of the show places of America. It recommends that the Federal Government acquire the entire gorge from the top of the Virginia bluffs to the hilltops in Maryland and from Georgetown to and including Great Falls. This area would then be supplied with foot and bridle paths, highways, and boat landings to make all of its scenery easily accessible.

The Commission would exclude power dams from the area, as it states they would "destroy the chief scenic values of the Great Falls and Potomac gorge," and, furthermore, are not necessary, because "adequate power may easily be otherwise obtained at a reasonable cost."

The value of this region to the City of Washington and to the whole Nation is hardly possible of expression. It is estimated that 150,000 visitors come to Great Falls each year on the Virginia side alone, while many more thousands take advantage of the better highway facilities available along the Maryland side.

Whether or not the gorge of the Potomac shall become a National Park rests with Congress, which must authorize its acquisition before the Park and Planning Commission can proceed beyond the boundaries of the District of Columbia. Certainly it could in no way be more useful to the Nation than in its natural state—a place of rare beauty and a joy forever to the rapidly increasing population of the Washington district and the ever-swelling, never-ending stream of visitors to the National Capital from all over the world.

Probably no other capital city in either hemisphere has scenic assets comparable to Washington's Great Falls and the Potomac gorge. The late Viscount James Bryce, Ambassador of Great Britain to the United States and staunch friend and admirer of America, in writing of the beauties of Washington in the NATIONAL GEOGRAPHIC MAGAZINE, said:

"It is impossible to live in Washington and not be struck by some peculiar features and some peculiar beauties which your city possesses. In the first place, its site has a great deal that is admirable and charming. There is rising ground inclosing on all sides a level space, and so making a beautiful amphitheater between hills that are rich with woods.

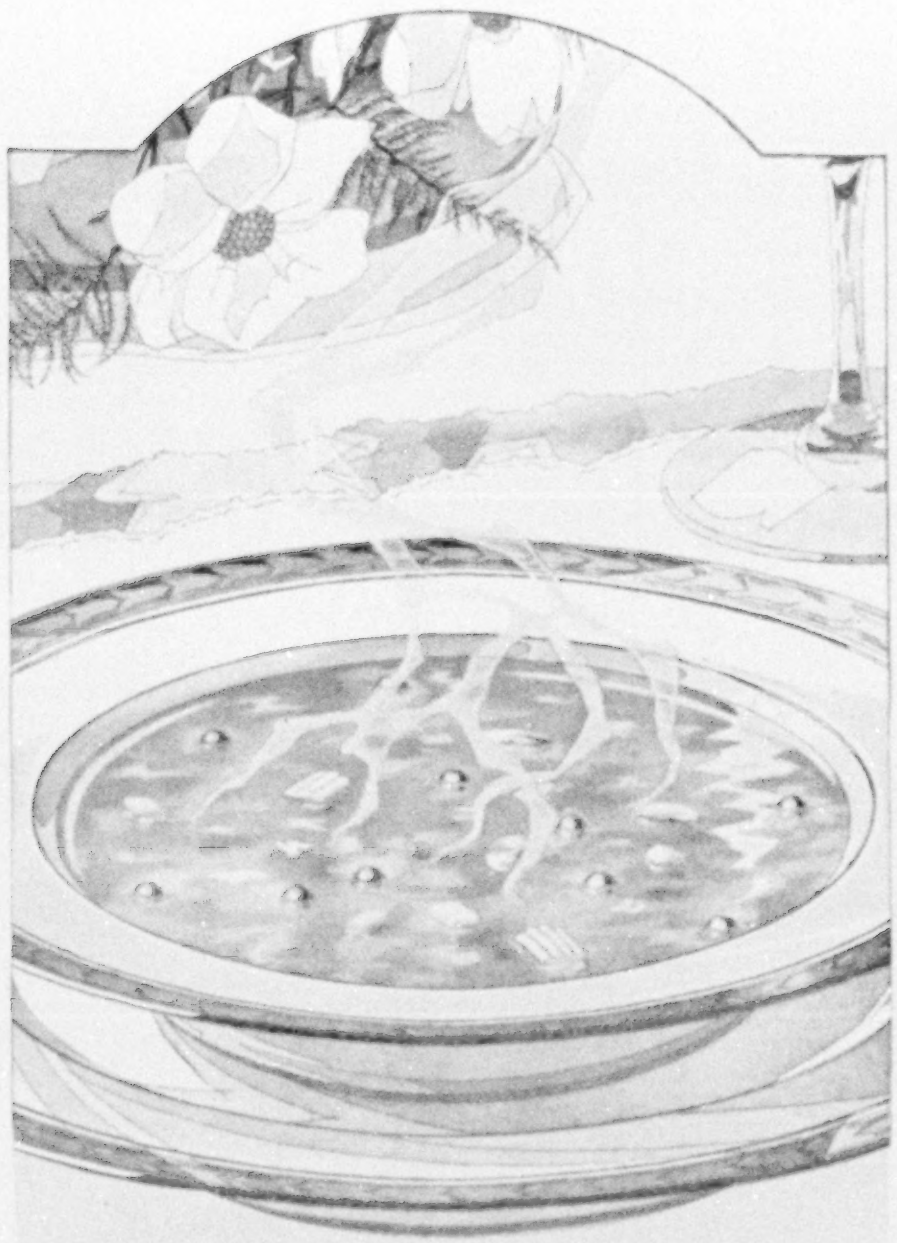
"Underneath these hills and running like a silver thread through the middle of the valley is your admirable river.

"The Potomac has two kinds of beauty—the beauty of the upper stream, murmuring over a rocky bed between bold heights crowned with wood, and the beauty of the wide expanse, spread out like a lake below the city into a vast sheet of silver.

"No European city has so noble a cataract in its vicinity as the Great Falls of the Potomac—a magnificent piece of scenery which you will, of course, always preserve."

Those who rejoice in the unusual scenic environment of the Nation's Capital feel that Oliver Goldsmith's solicitude on a certain subject might well be paraphrased in behalf of Great Falls:

A scenic wonderland, the Nation's pride,
When once destroy'd can never be supplied.



VEGETABLE SOUP
FOR TASTES THAT "KNOW"

LOOK FOR THE RED-AND-WHITE LABEL

SOUP
is now eaten every day!

WE NOW eat less, in bulk, but more in actually desirable and beneficial food. We now eat with a proper and enlightened respect for our digestion and our health. Over-eating is being displaced by intelligent and adequate eating.

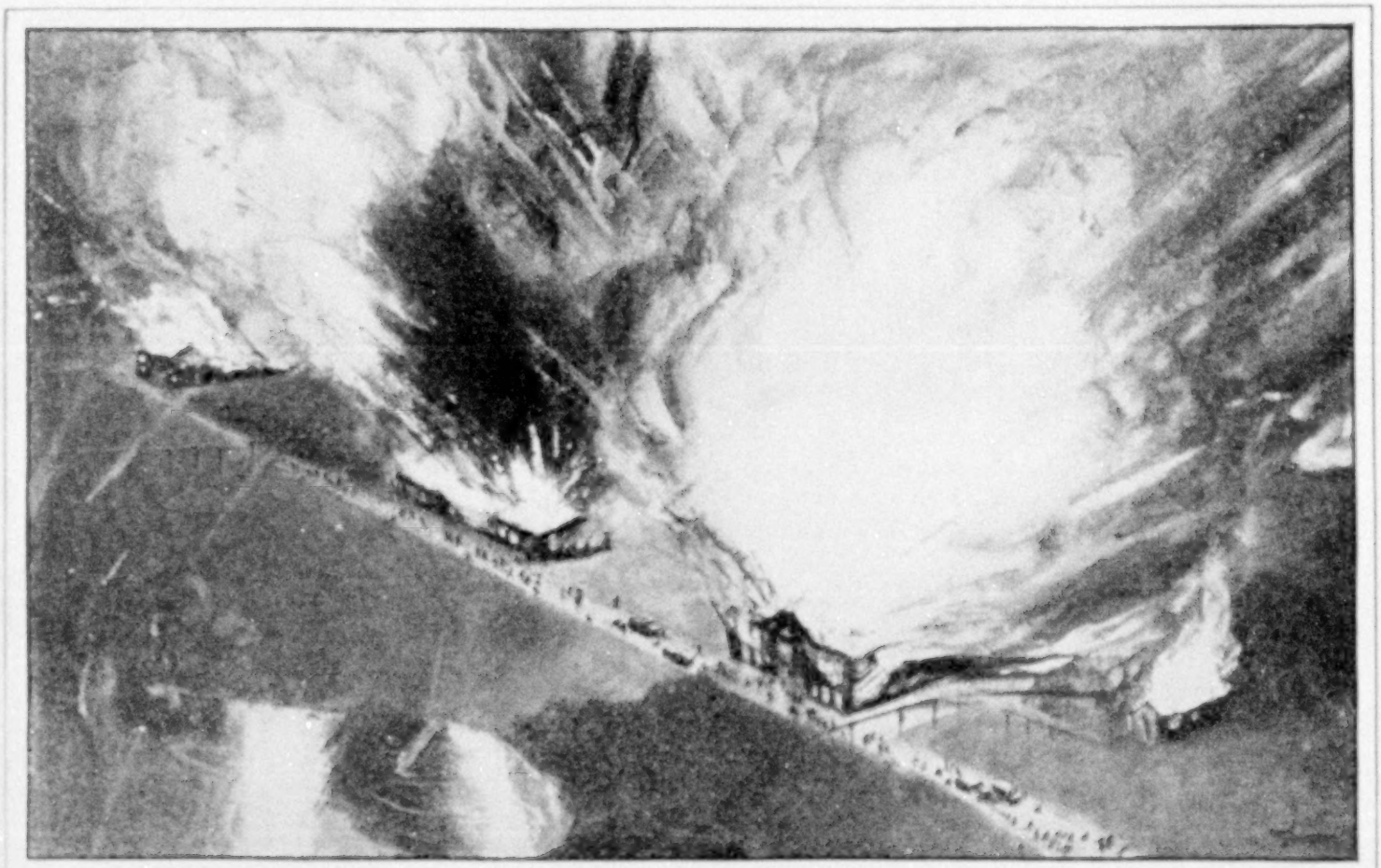
The dietitians have taught these lessons. And with these changes has come the astonishing increase in the use of soup.

SOUP HAS its own peculiar and special advantages that no other food can offer. It is liquid. It blends in many fascinating combinations and varieties, the savors and flavors of meats, vegetables, cereals, herbs and spices. It stimulates the flow of the digestive juices, supplies needed nourishment and promotes digestion.

HAND in hand with the new ideas in food has come this new Campbell's idea in soup—strict in quality, condensed in form, almost unlimited in variety, relieving the housewife of all the care and bother of soup-making, requiring only the addition of an equal quantity of water and a few minutes simmering. 21 different soups—all listed on the label. Your grocer has, or will get for you, any Campbell's Soups you select. 12 cents a can.

I'm on my way with feelings gay.
My appetite is real.
For in my hand is Campbell's grand—
I'm headed for *some* meal!

WITH THE MEAL OR AS A MEAL SOUP BELONGS IN THE DAILY DIET



The Spirit of Service

An Advertisement of the
American Telephone and Telegraph Company

In July, 1926, lightning struck the Navy Arsenal at Denmark Lake, New Jersey. The explosion demolished the $80,000,000 plant, rocked the countryside, left thousands homeless and many dead. While the community fled in terror, fresh explosions hurled fragments of shell and debris far and wide.

High upon the roster of those who responded to the call of duty were the telephone workers. Operators in the danger zone stayed at their posts. Those who had left for the day and others on vacation, on their own initiative, hurried back to help handle the unprecedented volume of calls. Linemen and repairmen braved exploding shells to restore the service. Within a little over an hour emergency telephone service was established, invaluable in caring for the victims and in mobilizing forces to fight the fire which followed.

In spite of repeated warnings of danger still threatening, no telephone worker left the affected area.

Through each of the day's twenty-four hours, the spirit of service is the heritage of the thousands of men and women who have made American telephone service synonymous with dependability. In every emergency, it is this spirit that causes Bell System employees to set aside all thought of personal comfort and safety and, voluntarily, risk their lives to "Get the message through."

"Which bonds should I buy?"

Those dependent upon the earnings of invested funds should see to it first of all that their principal is always safeguarded. At offices in over fifty American cities National City bond men are ready to help investors select issues which offer a suitable combination of security and income. Their recommendations are based upon the Company's wide experience in fitting good bonds to the varying needs and circumstances of the buyer.

The National City Company

National City Bank Building, New York

OFFICES IN 50 AMERICAN CITIES · INTERCONNECTED BY 11,000 MILES OF PRIVATE WIRES · INTERNATIONAL BRANCHES AND CONNECTIONS

Your personal friend—everywhere you travel in Europe

WHAT a comfortable feeling to know that at the arrival ports of Europe—at railroad stations, frontier and customs offices abroad there is a personal friend of *yours* ready to smooth the way for you ...to help you whenever you are confused.

Your letter of introduction to this helpful man is your sky-blue *American Express Travelers Cheques.* When you change your cash into this practical, convenient and protective travel currency you receive not merely its equivalent in money ...but ALL the *extra* advantages that the world-wide service of the *American Express Travel Department* offers.

Money insurance plus world-wide service at 75c per $100

American Express Travelers Cheques are issued in denominations of $10, $20, $50 and $100 and are sold in 22,000 banks, American Express and American Railway Express offices. Helpful service and protection begin the moment you buy, whether it be a $10 cheque or $20,000 worth.

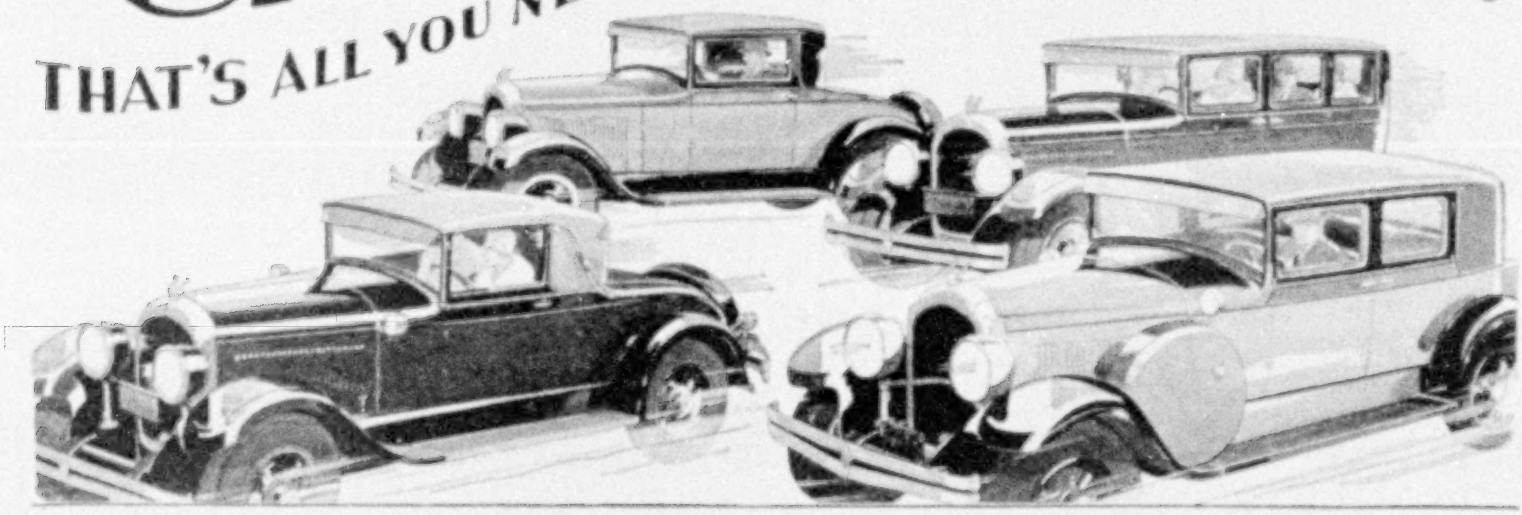
Merely ask your banker for the sky-blue—

Safe anywhere Spendable everywhere

AMERICAN EXPRESS
Travelers Cheques

CHRYSLER—

THAT'S ALL YOU NEED TO KNOW ABOUT A MOTOR CAR



REGARDLESS of what you may intend to invest in an automobile—or what your demands may be in style, size and performance—you will find complete satisfaction in a Chrysler.

Every car that bears the Chrysler name is the product of that famous Chrysler Standardized Quality of engineering and precision manufacturing which from the beginning pioneered and developed countless betterments for its cars of higher price and has applied them to its cars of lower price.

Under such a guarantee of superiority—there is none like it in the motor car industry—you can buy any Chrysler with full confidence that it represents supreme performance, appearance, quality and value in its price field.

Compare the specifications — test the performance in any way you choose — you'll find a Chrysler, whether "52," "62," "72" or 112 h. p. Imperial "80," that will meet your needs and means better than any other car.

New Chrysler "52"—Seven body styles, $670 to $790. *Great New Chrysler "62"—Seven body styles,* $1065 to $1235. *Illustrious New Chrysler "72"—Seven body styles,* $1545 to $1795. *New 112 h.p. Chrysler Imperial "80"—Fourteen custom body styles by Chrysler, Dietrich, Locke and LeBaron,* $2795 to $6795.

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Whatever your driving conditions

—climate—weather

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your car will run best on

ETHYL GASOLINE

There is nothing mysterious about Ethyl Gasoline. It is selected motor gasoline containing "ETHYL" fluid, the compound developed by General Motors Research to take advantage of the higher compression created by carbon or by advanced engine design.

So effective is "ETHYL" fluid—a patented compound containing tetraethyl lead—that less than a teaspoonful to a gallon of gasoline gives you car performance you have never known before.

You get more power on hills and heavy roads, quicker acceleration, reduced gear-shifting and a cooler engine—*and as for high compression engines, Ethyl Gasoline made them possible!*

More than 1,000,000 car owners are now riding with "ETHYL." And its price is merely the price of good gasoline plus the few extra pennies that the "ETHYL" ingredient costs.

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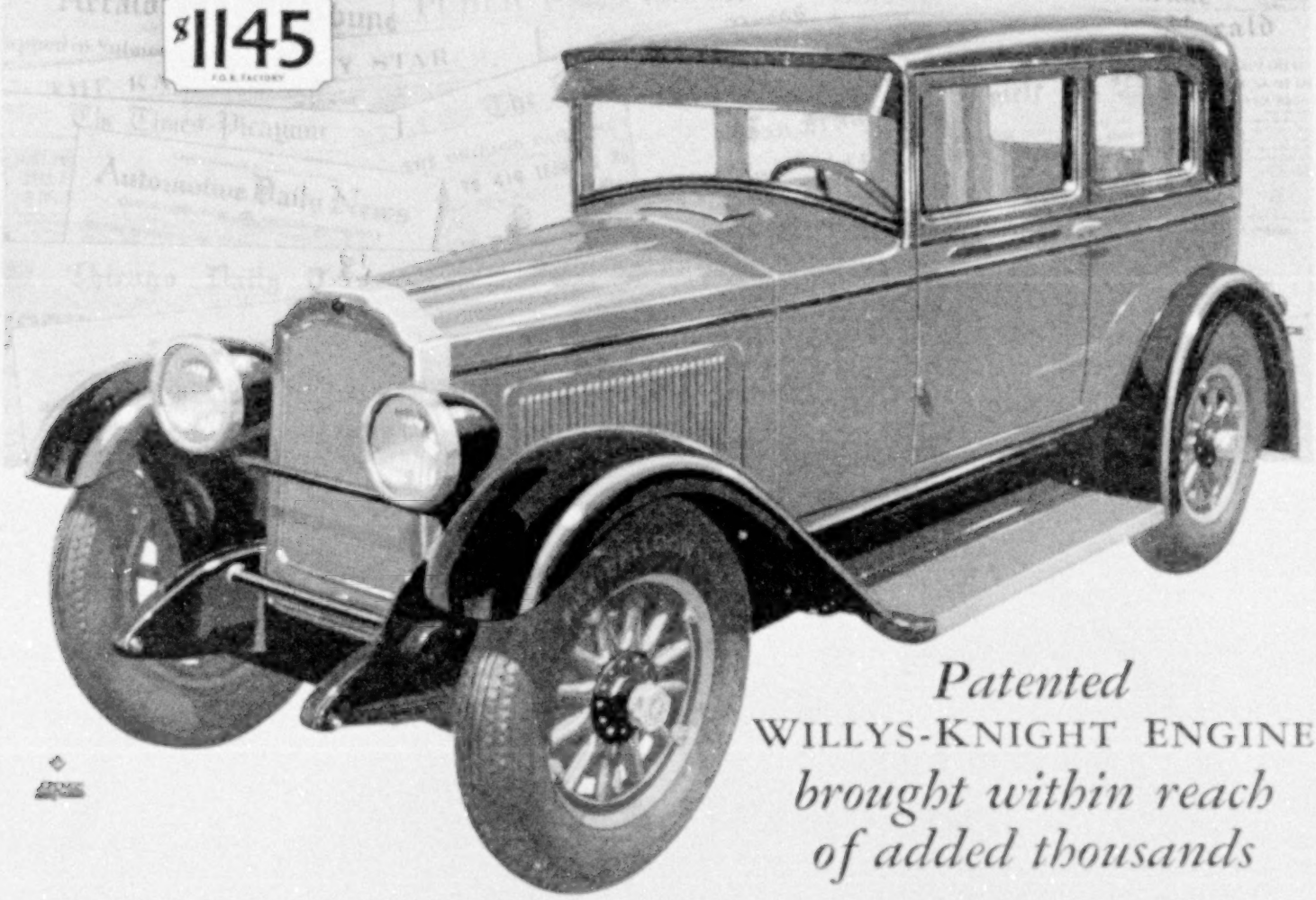
ETHYL GASOLINE IS THE YARDSTICK BY WHICH OTHER GASOLINES ARE MEASURED.

THE GREAT NATIONAL HEADLINER!



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WILLYS-KNIGHT ENGINE
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THE beautiful, new, Willys-Knight Standard Six, from the moment of its introduction at the National Automobile Show, has won an enthusiastic reception that literally blankets the nation.

The superiority of the *patented* Willys-Knight sleeve-valve engine has long been accepted. Naturally, it costs more to build this advanced motor. It is only today, after fourteen years of experiment and progress, that we have reached our goal of incorporating this superior engine in a low-priced Six maintaining all of Willys-Knight's quality supremacy.

The Standard Six inherits the qualities which have won world-wide prestige for Willys-Knight. The new car is distinguished by eminently typical Willys-Knight brilliance, sturdiness, economy, simplicity, quick starting and ease of control.

Two other advanced Sixes

Willys-Knight Special Six—improved, finer; now with added refinements and beautiful new color options. Willys-Knight Great Six—one of America's most luxurious cars. Now, a larger, more powerful engine insures even higher speed, flashier pick-up.

Willys-Knight Sixes range in price from $1145 to $2695, in the Standard Six, Special Six and Great Six divisions. Prices f.o.b. factory and specifications subject to change without notice.

The perfected Whippet—$535

Rounding out the great Willys-Overland line, the 1928 Whippet still leads the light car field—in performance records, in features of mechanical and engineering superiority—many of which were first brought to the light car field by Whippet—and in proved merit in the hands of its owners. Now, at new low prices of $455 to $585, Whippet is more than ever the leader in light car value. Willys-Overland, Inc., Toledo, Ohio. Willys-Overland Sales Co., Ltd., Toronto, Canada.

WILLYS-KNIGHT SIX

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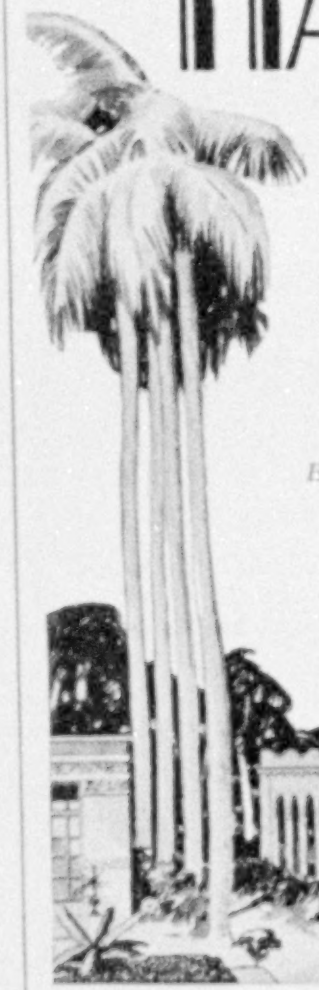

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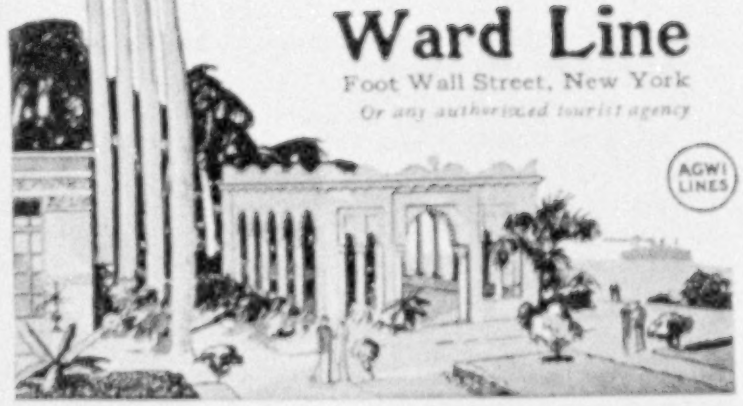

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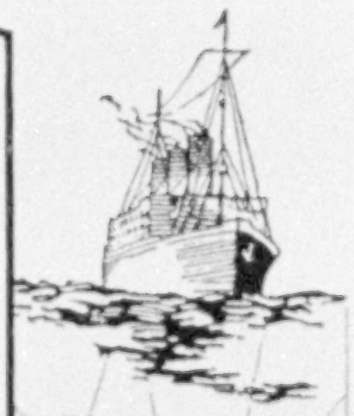

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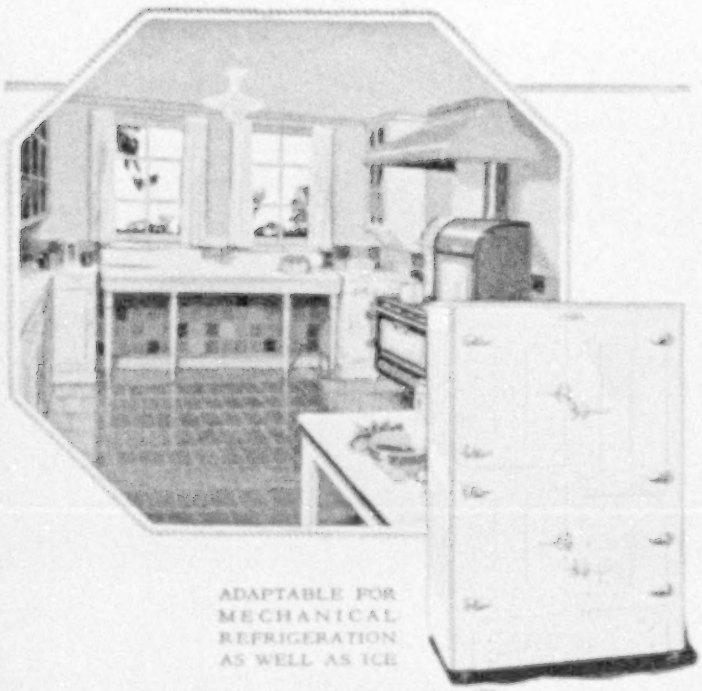

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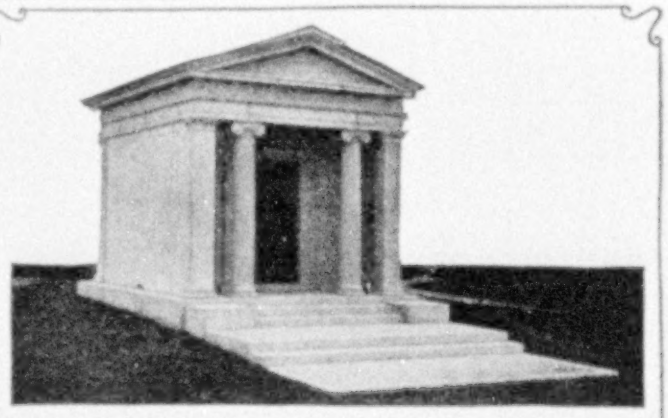

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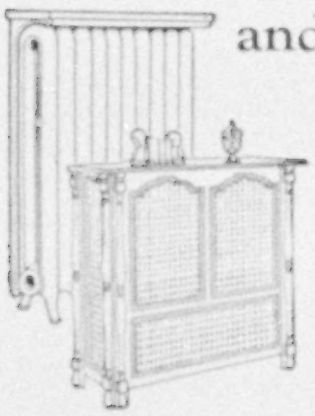

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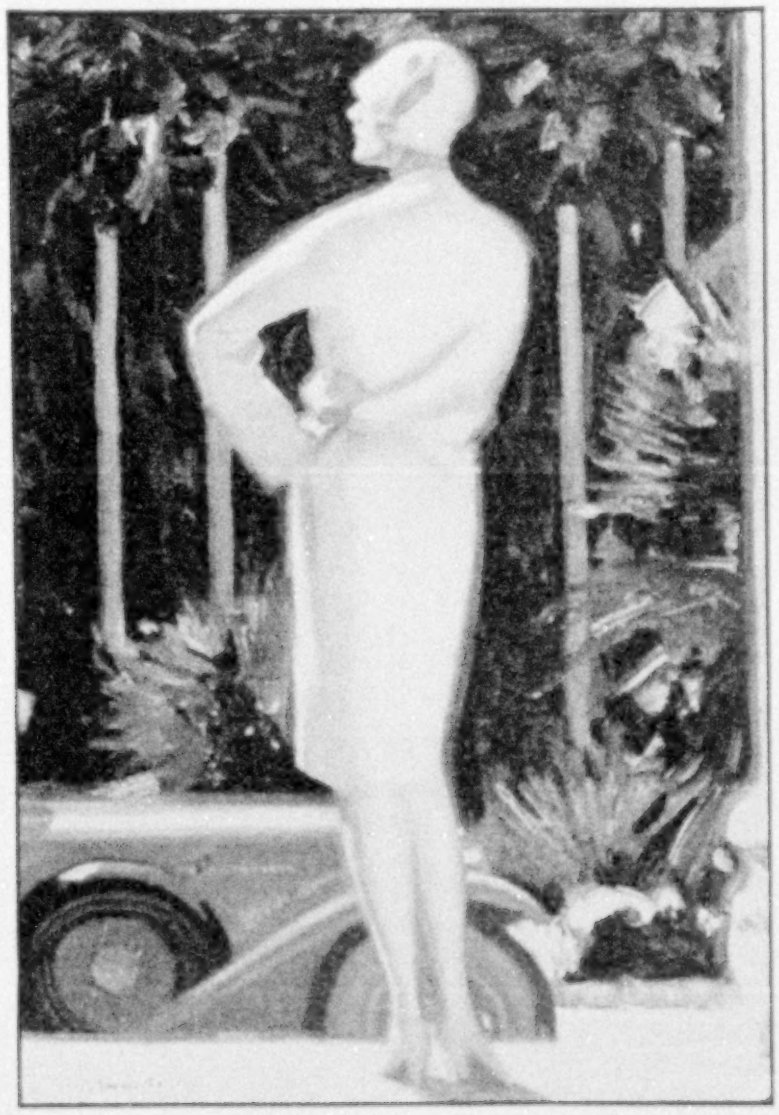

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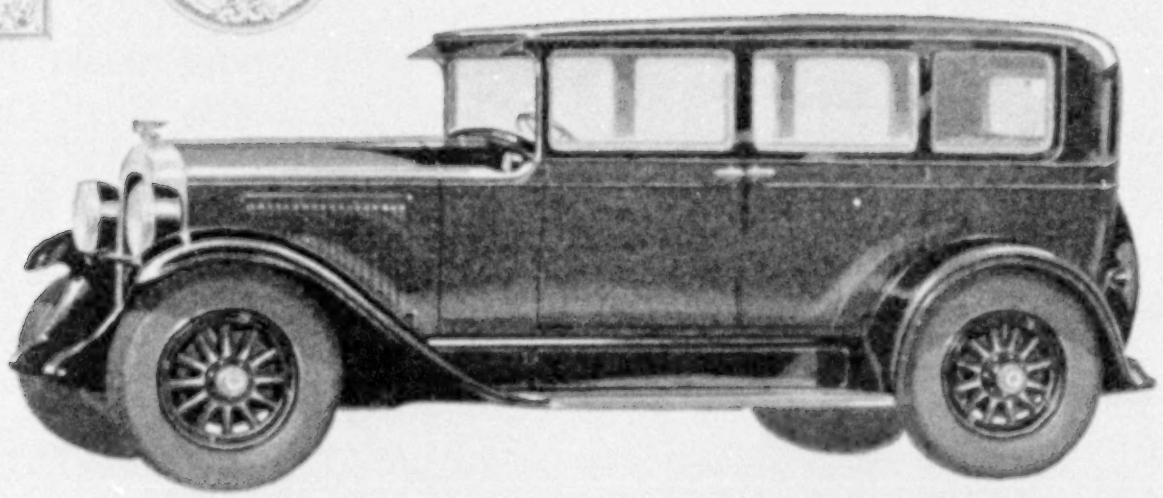

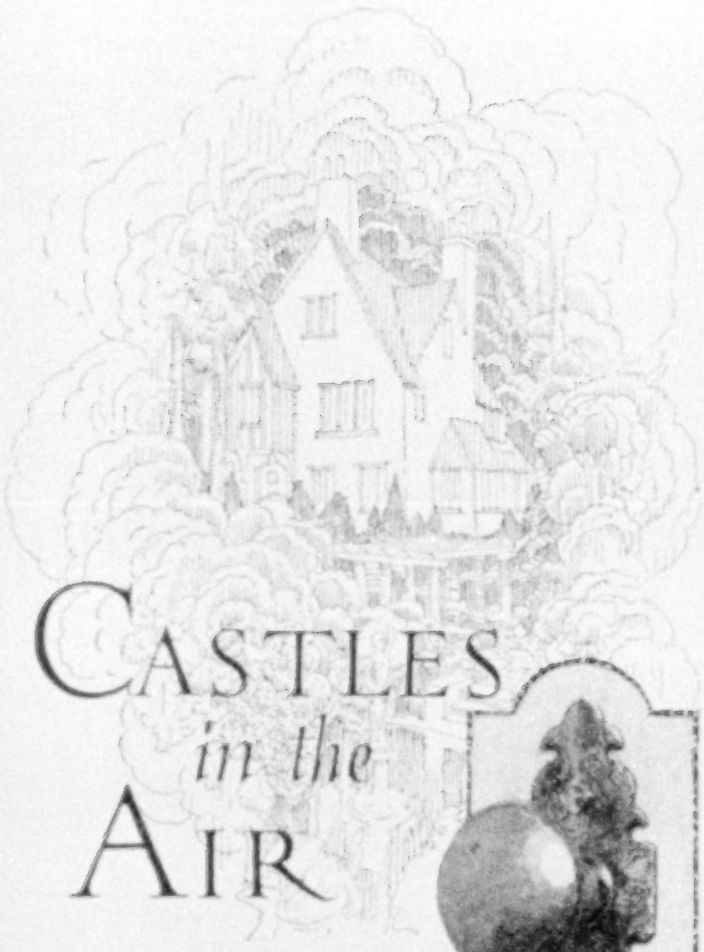

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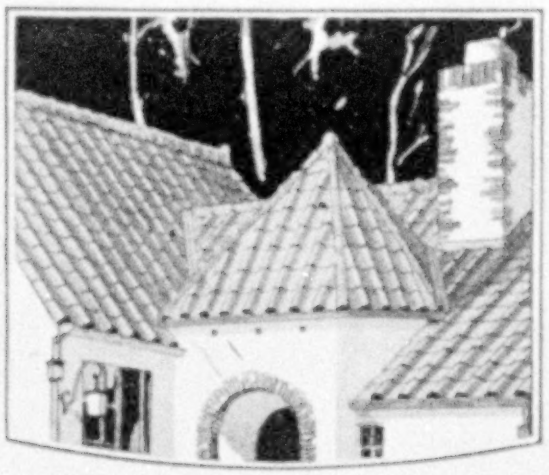

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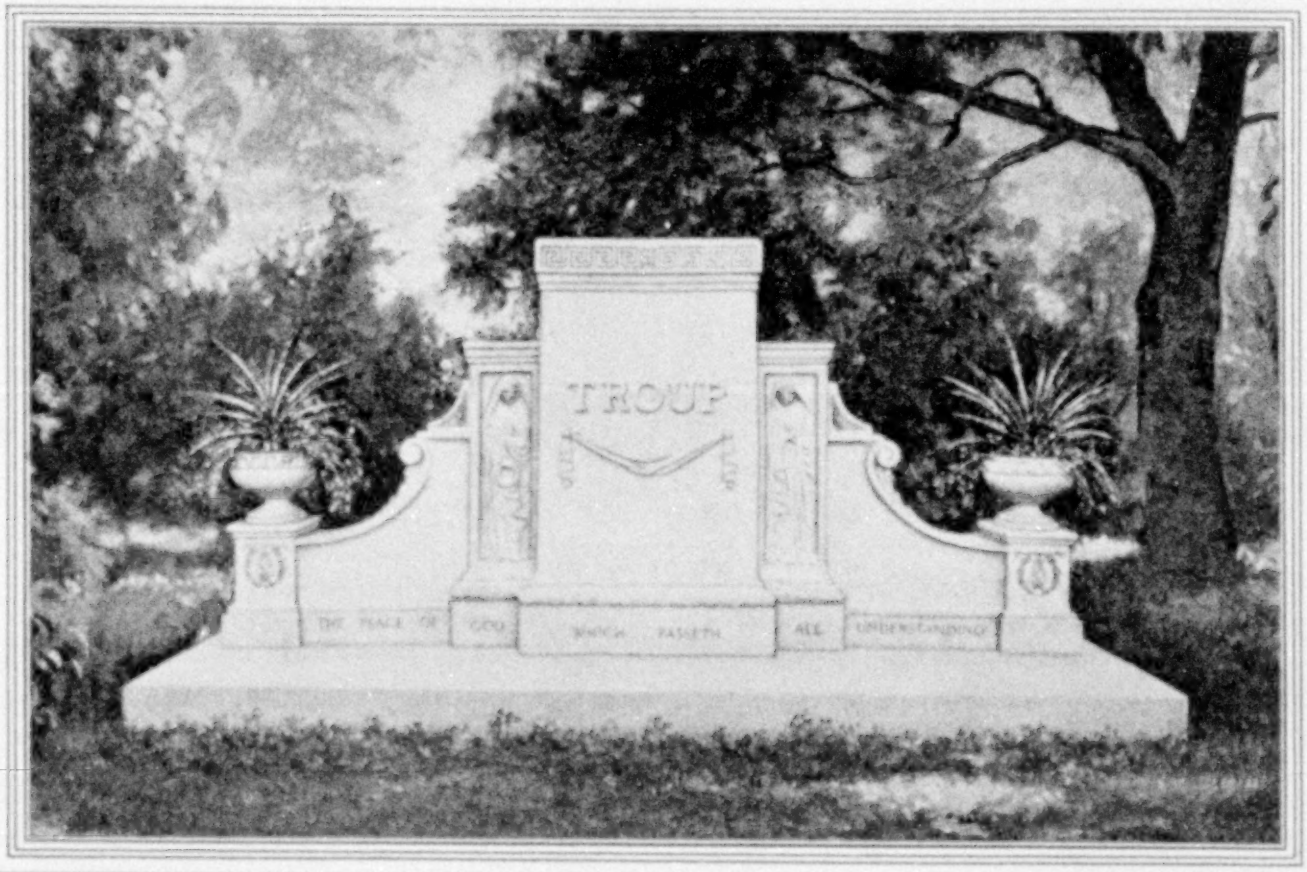

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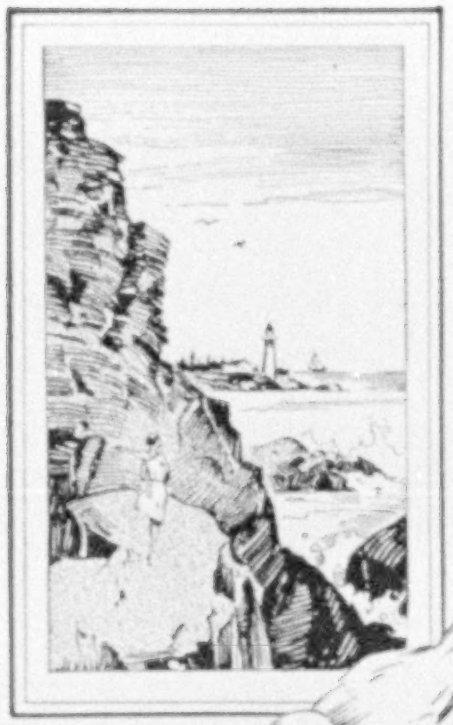

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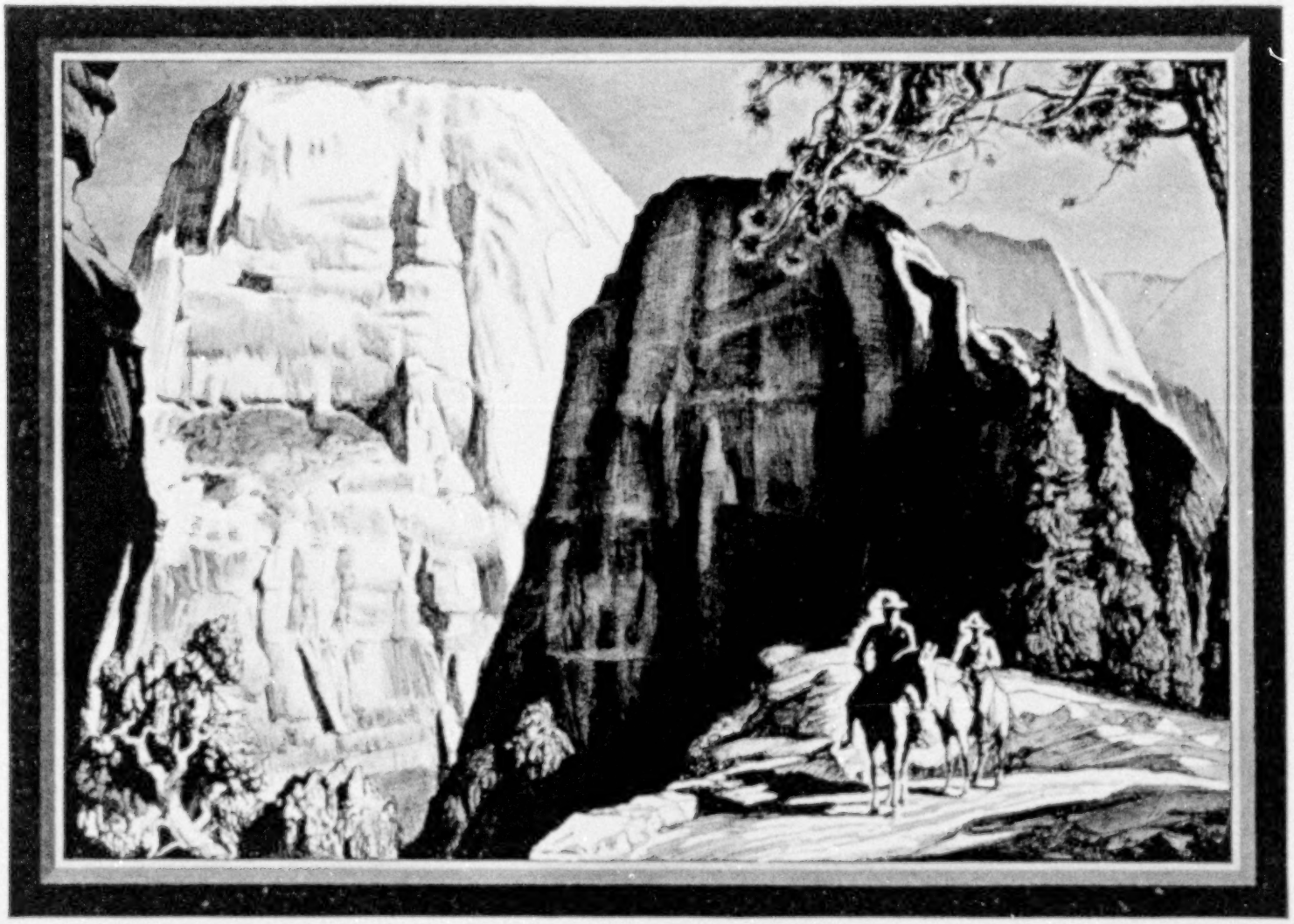

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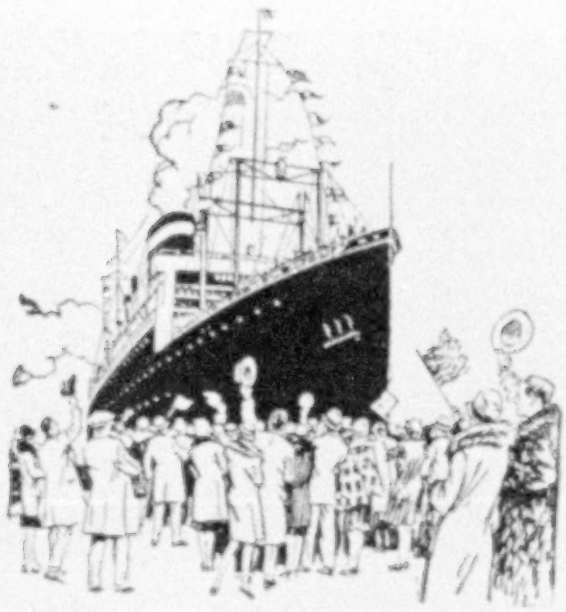

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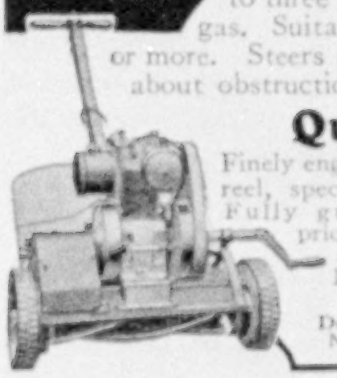

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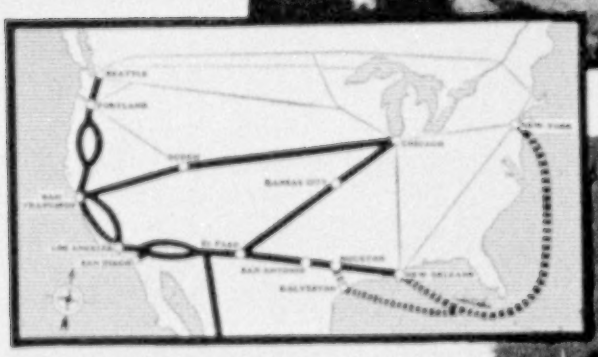

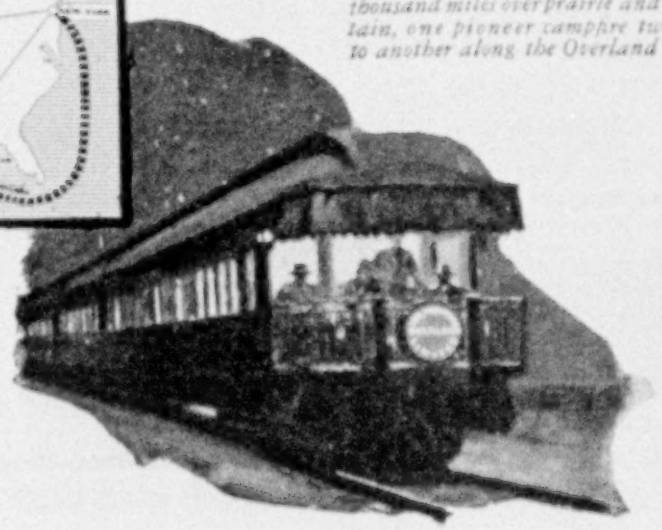

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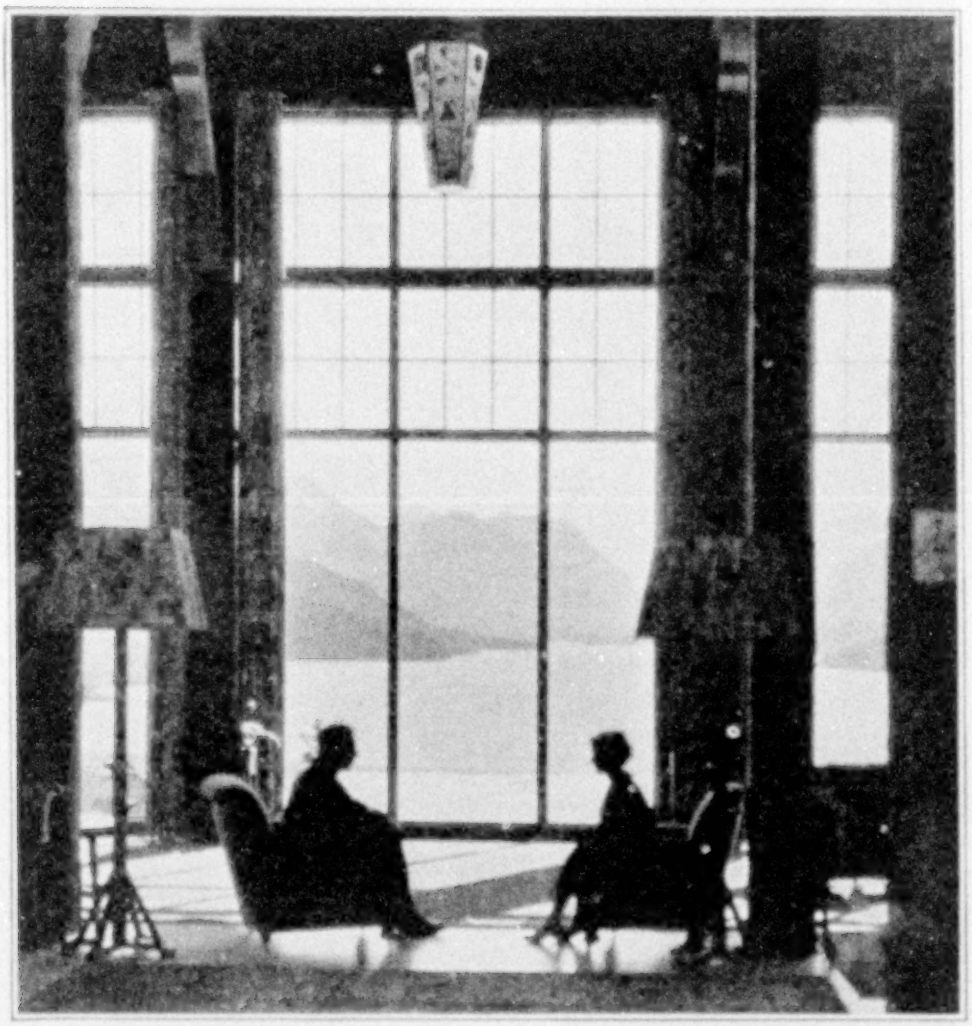

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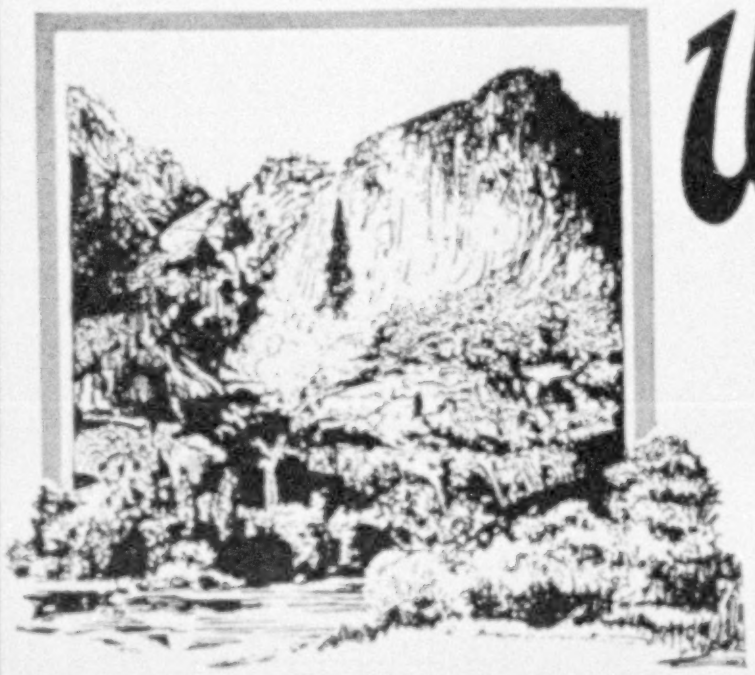

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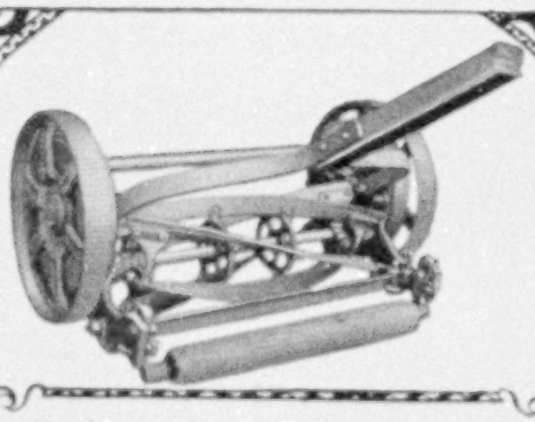

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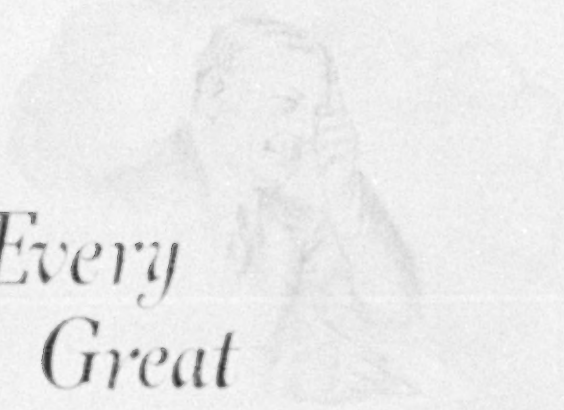

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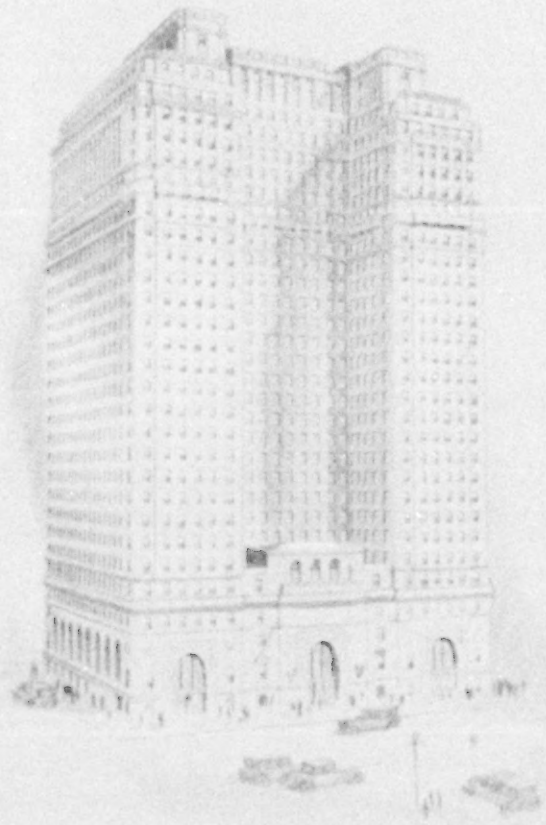

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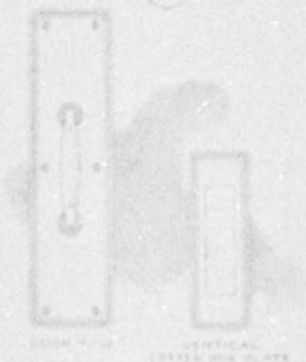

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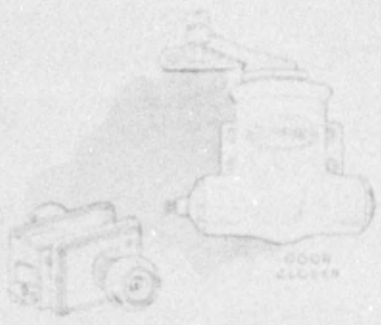

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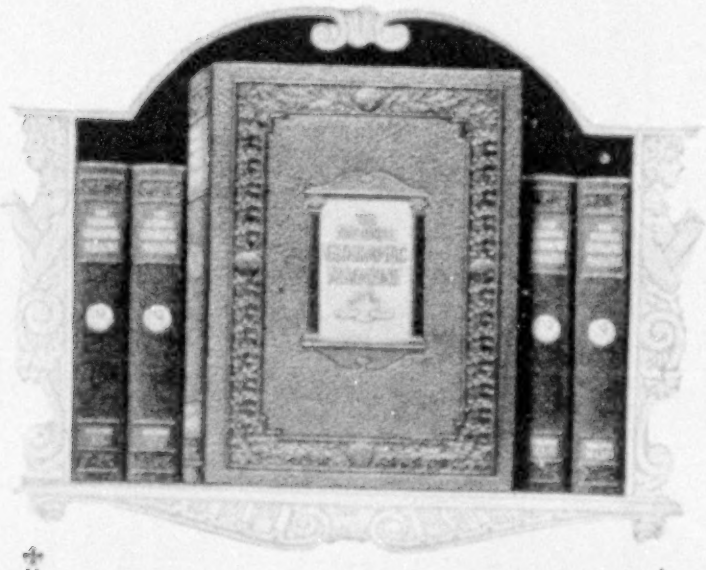

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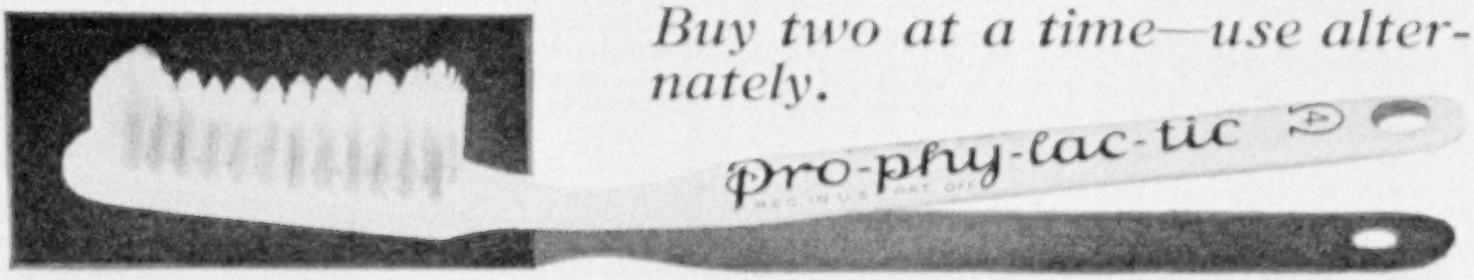

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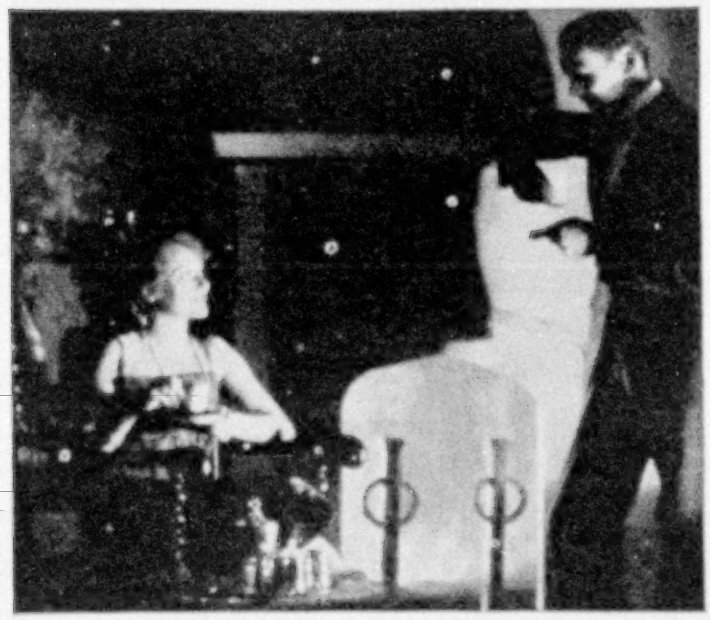

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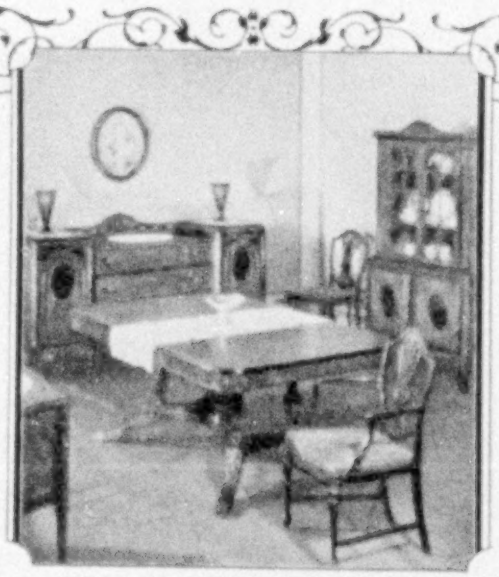

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Michigan-Wisconsin birch trim, floors, doors and veneer paneling (furniture, too) are an asset to any home. Nearly "marproof" hardness insures a fine appearance permanently.

Let us give you all the facts about this premier cabinet-wood. They are concisely stated in our new "Beautiful Birch" brochure; also, illustrations of many fine interiors by eminent architects. Sent free.

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Always use O-Cedar Polish the O-Cedar Polish Way: Wet a piece of cloth with water, wring it almost dry, pour on a few drops of O-Cedar Polish, go over the surface to be cleaned, then rub with a dry cloth.

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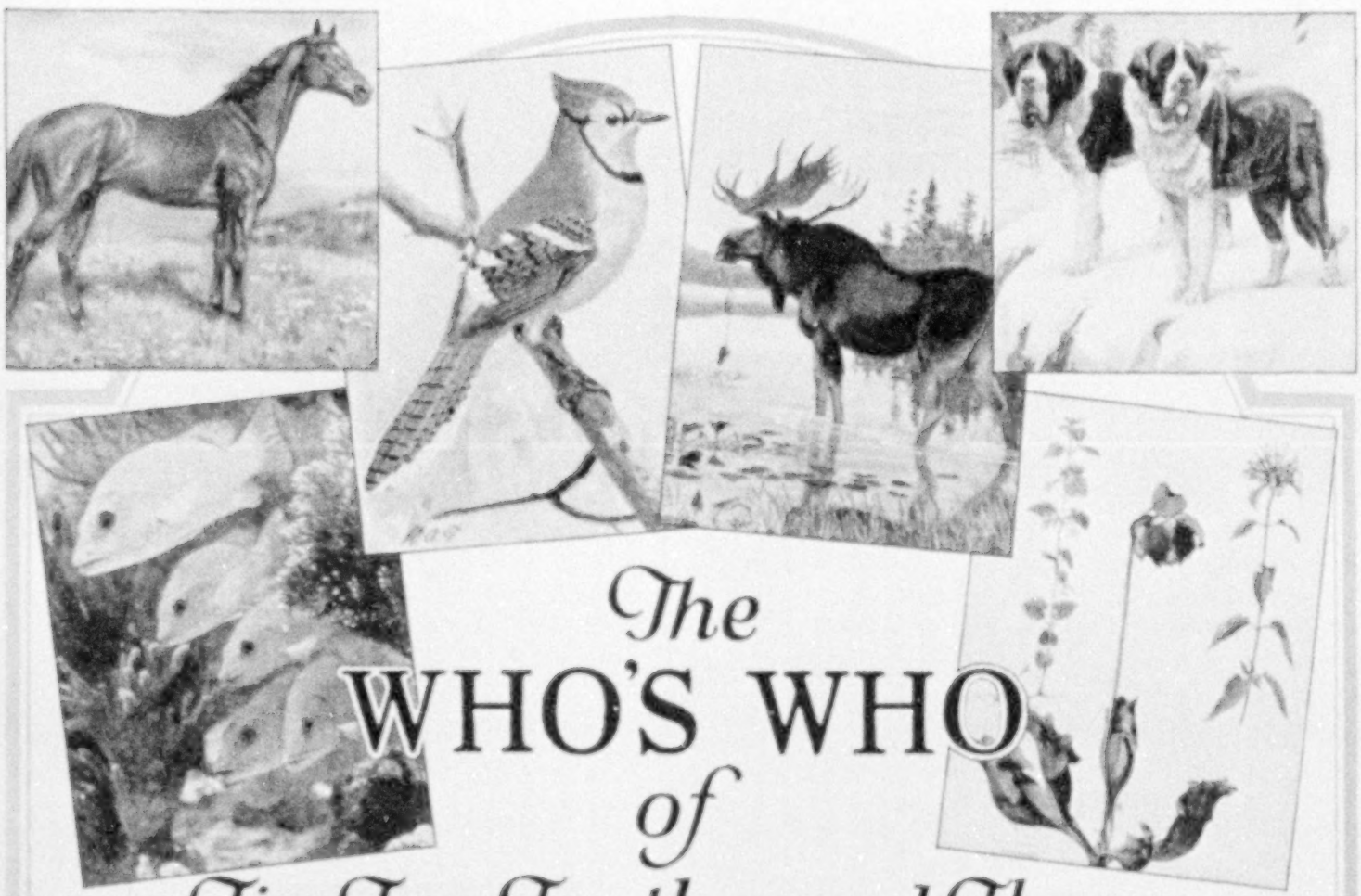

The WHO'S WHO of Fin, Fur, Feather and Flower

To Hold Communion with Spring's Visible Forms—

The Book of Birds (*Revised and Enlarged Edition, 1927*)—by Henry W. Henshaw; full-color portraits of 331 birds by Louis Agassiz Fuertes; many engravings and 12 bird migration maps; 230 pages; Molloy-made art binding, $4.

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Wild Animals of North America—by Edward W. Nelson, former Chief of United States Biological Survey; 127 full-color portraits by the famous naturalist-artist, Louis Agassiz Fuertes; 86 engravings; 240 pages; bound in durable brown buckram, $3.

The Book of Fishes—by John Oliver La Gorce and other authorities; under-water action portraits in full color of 92 fishes by Hashime Murayama; 243 pages; Molloy-made art binding, $4.

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The Book of Dogs (*1927 Edition*)—A veritable "Bench Show" by leading authorities who discuss mankind's best friend; full-color portraits by Louis Agassiz Fuertes and Hashime Murayama of 102 dogs; 110 pages; Molloy-made art binding, $3.

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3-28 Descriptive illustrated booklet on request

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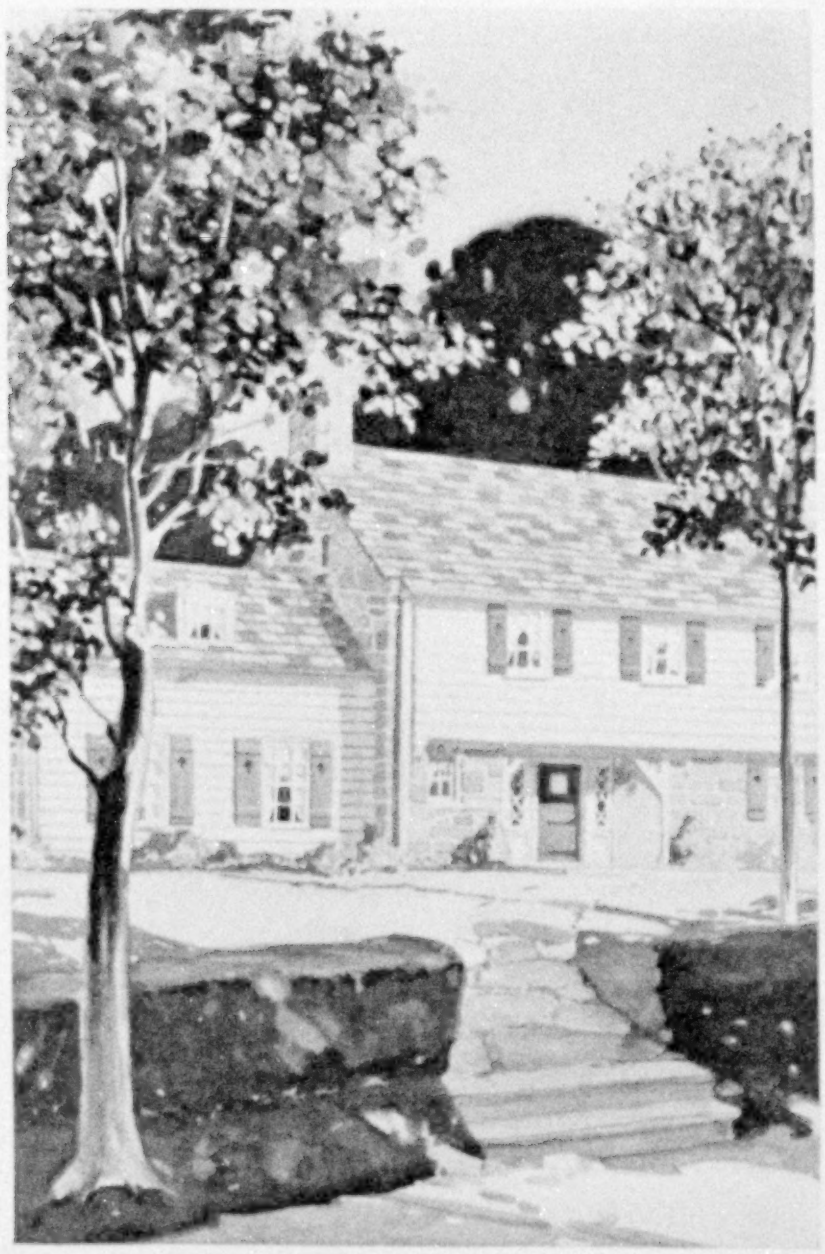

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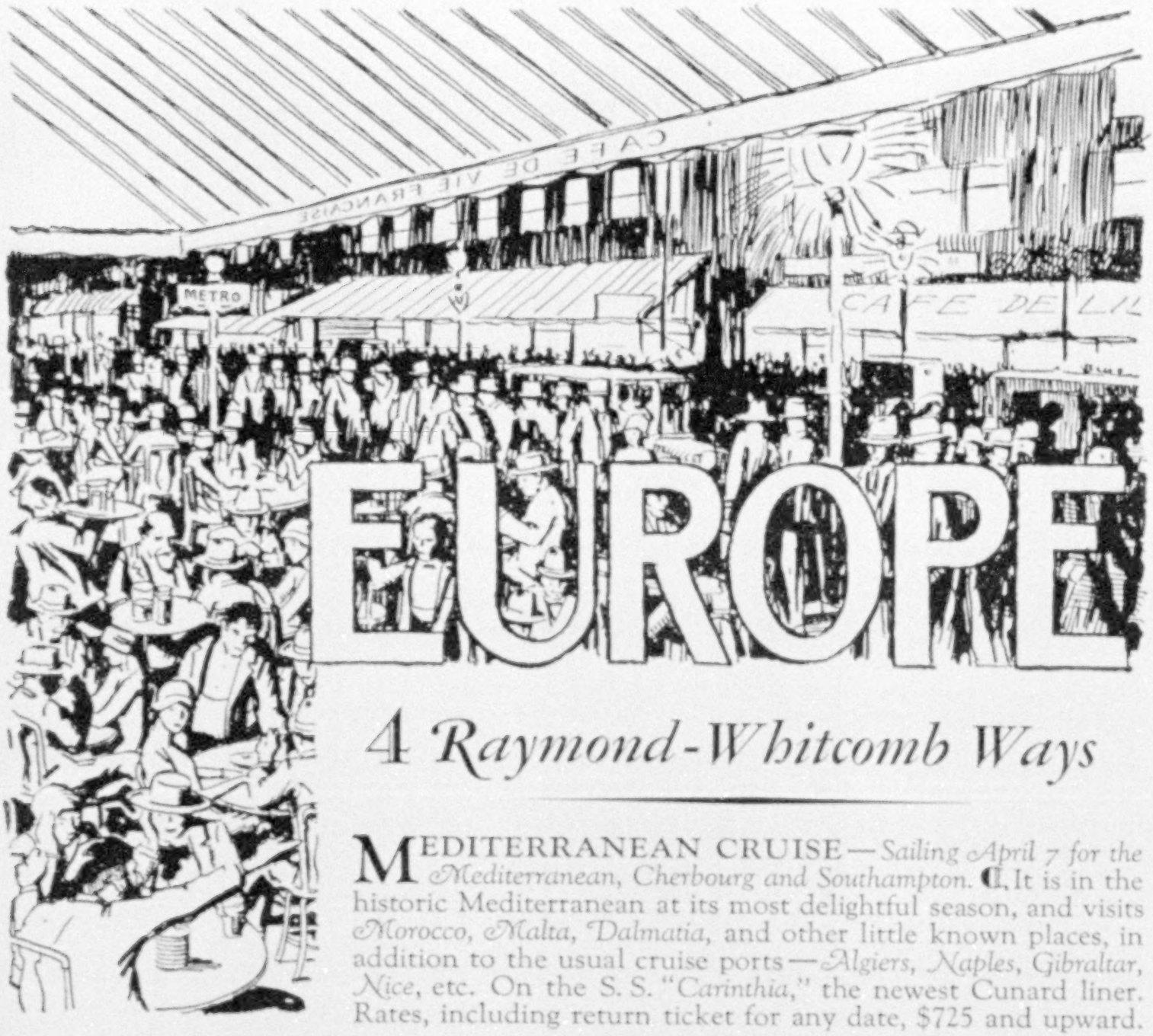

EUROPE

4 *Raymond-Whitcomb Ways*

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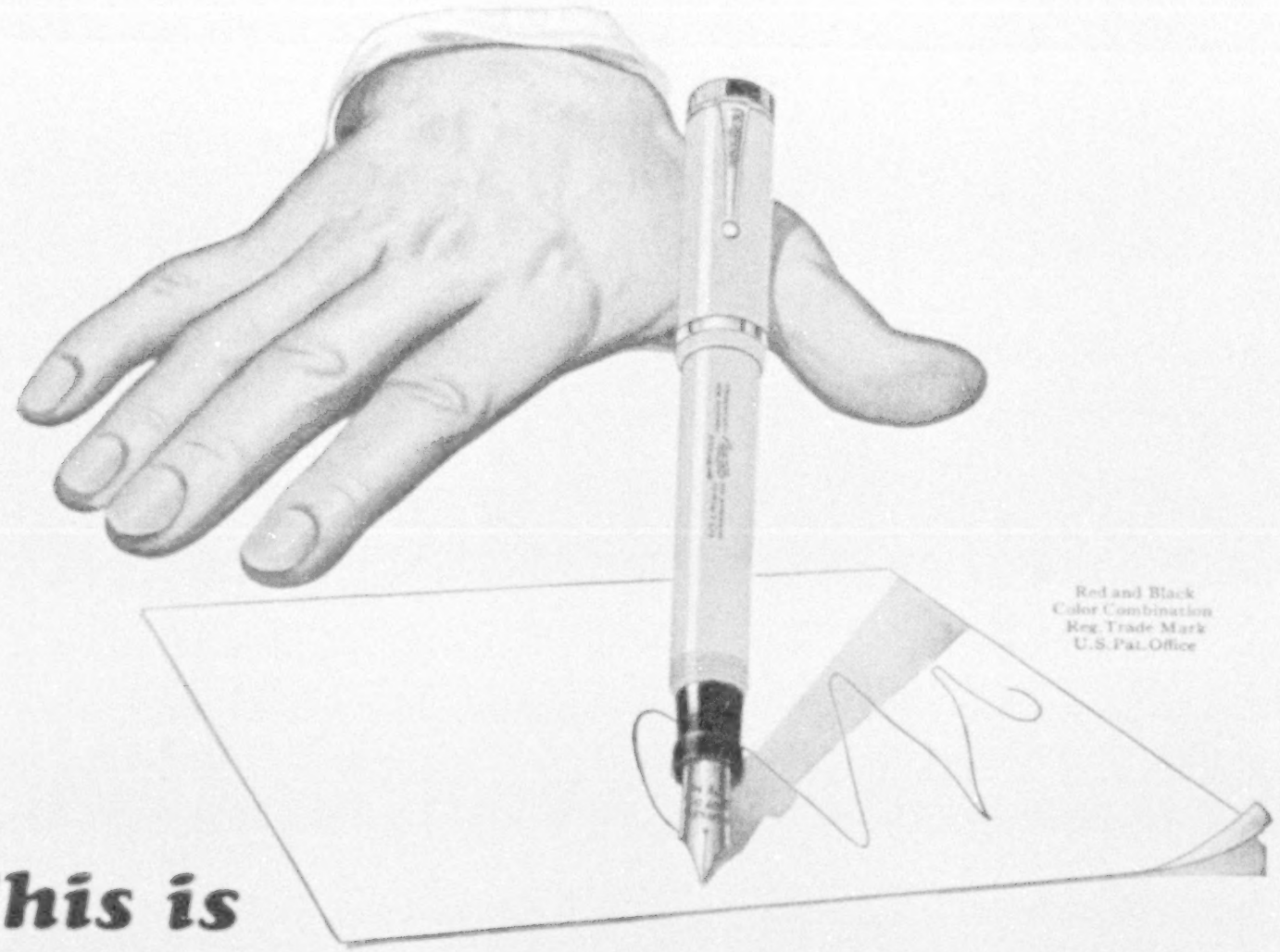
"Positive Agitation" enables the Hoover to remove more *dirt per minute*. It reaches the deeply-buried dirt by the time-tried effective method—beating reduced to scientific exactness.

We will gladly demonstrate to you in your own home that the Hoover does remove the most *dirt per minute*. Telephone your Authorized Hoover Dealer.

Cash prices, Model 700 Hoover, $75. Model 543, $59.50. Dusting tools, $12.50. Easy payments if desired. Only $6.25 down. Prices slightly higher west of the Rockies and in Canada. Hoover Dealers will make you an allowance on your old machine.

THE HOOVER COMPANY, NORTH CANTON, O.
The oldest and largest maker of electric cleaners... The Hoover is also made in Canada, at Hamilton, Ontario

PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.



Red and Black
Color Combination
Reg. Trade Mark
U.S. Pat. Office

This is Pressureless Touch

This pen's feather-light weight alone is sufficient to start it writing instantly and keep it writing. Scarcely any pressure from your fingers, no effort, no fatigue. You simply guide this pen.

Doubly remarkable is this improvement, because the new Duofold is 28% lighter in weight than when made with rubber. Now we are using Parker Permanite, a new material. This pen, therefore, is one of the lightest writing instruments we know.

And while making the pen lighter, this material has made it Non-Breakable also. We have thrown these new Duofolds from an aeroplane 3,000 feet aloft and not one has broken.

But Pressureless Touch is most important because of its effect of taking all the effort out of writing. It clears the track for THINKING as no other feature in a fountain pen has ever done before.

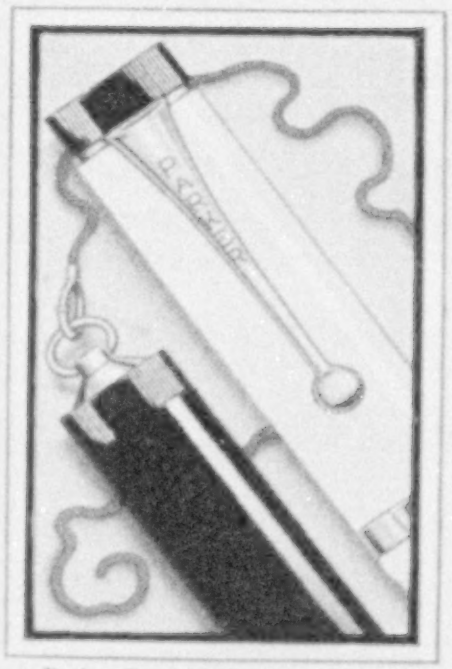
Five smart colors—Lacquer-red, Lapis Lazuli Blue, Green Jade, Imperial Mandarin Yellow [new] and flashing Black and Gold—all black-tipped. Duofold Pencils to match.

Three sizes of pen barrels—the Oversize, the Junior and the slender Lady Duofold, each offering six styles of pen points tempered to yield to any hand but proof against distortion from the shape you like.

Get all these Parker features by being sure to look for "Geo. S. Parker—DUOFOLD," imprinted on each pen or pencil. Don't let color only be your guide.

$7 and $5
according to size

There is no reason today to pay more than Parker Prices for a fountain pen. You can't buy more than DUOFOLD EFFICIENCY which will last you all your life.



Parker Duofold Pencils to match Duofold Pens. The lead turns out for writing, in for carrying. $3, $3.50 and $4.

THE PARKER PEN COMPANY, JANESVILLE, WIS.

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The Permanent Pen

Parker

Duofold

OVER-SIZE $7

Duofold Jr., $5 Lady Duofold, $5